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The Public Lighting Tables of the American Meter Company will be found in the page advertisement of that Company.

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[OFFICIAL NOTICE.]

Ninth Annual Meeting, Pacific Coast Gas Association.

OFFICE OF THE SECRETARY,
415 POST STREET, SAN FRANCISCO, CAL.,
June 5th, 1901.

To the Members of the Pacific Coast Gas Association: The Ninth Annual Meeting of the Pacific Coast Gas Association will be held at the offices of the San Francisco Gas and Electric Company, 415 Post street, San Francisco, Cal., Tuesday, Wednesday and Thursday, July 16, 17 and 18, 1901.

The technical programme calls for the following:

"President's Address;" by Mr. John A. Britton, Oakland, Cal.

"Report on International Congress of the Gas Industry, Paris, 1900;" by Mr. J. B. Grimwood, San Francisco, Cal.

"Distribution of Alternating Currents;" by Mr. George C. Holberton, Oakland, Cal.

"Promotion of Domestic Fuel Gas Consumption;" by Mr. R. P. Valentine, Sacramento, Cal.

"Practical Power Transmission;" by Mr. John Martin, San Francisco, Cal.

"Experience with Carburetted Water Gas Sets;" by Mr. A. C. Beck, Oakland, Cal.

"Practical Testing of Oils for Gas and Fuel Purposes;" by Mr. L. P. Lowe, San Francisco, Cal.

It is urgently requested that members interest themselves in the "Wrinkle" and "Experience" departments, and that their communications thereon be forwarded without delay to the respective Editors thereof: Mr. George H. Hollidge, Merced, Cal.; and Mr. O. M. Gregory, San Jose, Cal. Both named departments offer unlimited opportunities for the advancement of our common interests; but the measure of success is entirely dependent upon the efforts of the individual members. Let everyone contribute liberally.

Those who have questions to propound are reminded that the same should be forwarded to the Secretary in good season, in order that the "Question Box" should be filled with interesting matter for discussion by the members.

The Secretary announces that his services are at the ready disposal of the members, and that all communications or requests addressed to him will be promptly replied to or answered. He will be at headquarters prior to and during the meeting, and will be glad to render assistance, in the matter of securing hotel accommodations for those living at a distance, or in any other way whatsoever.

An informal meeting will be held at headquarters, Monday evening, July 15th, to which all are cordially invited.

J. B. GRIMWOOD, Secretary.

BRIEFLY TOLD.

MR. BARRET'S "MEMORANDUM" ON THE RESULTS OF THE WORKING OF INCLINED RETORTS AT LOUISVILLE, KY.—Last week, our chapters of the proceedings of the Louisville meeting of the Western Gas Association included the paper by Mr. A. H. Barret, Chief Engineer of the Louisville Gas Company, who had for his theme the way in which

LIBRARY OF CONGRESS

the inclined retort installation at his works developed results for the last 3 months of 1900 and the first 3 months of 1901. A very wise authority it was who said that "Brevity is the soul of wit," and so admitting we must all decide that Mr. Barret is wit's master, from the brevity of his communication. His memorandum takes up just 25 lines of the JOURNAL, 4 of which lines are devoted to the titling. The 21 lines, however, of his communication held in them the certainly concise story of a half year's hard combat with a practically, on personal working account, unfamiliar problem, and they also show that the gentleman who, when asked to choose, some time ago, by certain participators in ownership of the Louisville Gas Company, to elect whether he would remain as the Company's Engineer, or serve it as Vice-President, accepted the former place and relinquished the latter one, made no mistake in his choosing, either for them as interest absorbers or for himself as an advanced working gas man. The readers of the JOURNAL know well that Mr. Barret was the first gas engineer in the United States to seriously consider here the construction of a generating house on the inclined principle, and that he was the first with us also to put his consideration into practice. With the courage that is in him, he told, in Denver last October, at the meeting of the American Gas Light Association, the construction that had been accomplished, and in Louisville, last month, he told the results that had been gained through the operation of such construction. Even a superficial look through the figures that he gives rather goes to show that no mistake was made in the putting in of inclines in Louisville; in fact, we might go quite a step further, and say that, in the changing over of the Louisville generating house, if inclines had not been installed, a grievous mistake would have been made. The Kentuckian's "memorandum" is to others a matter worth close study; to himself it must be a thing of satisfaction. He had the courage of a pioneer, the reliance of a trained engineer, and the faith of his associates. The result is success, and we are all glad to know that such is his reward. That the "memorandum" was appreciated is best shown in the excellent discussion that it brought out. It would seem, by-the way, that it is now "up" to that other clever gas engineer (Mr. F. J. Mayer, of Baltimore, Md.) to tell what has been accomplished in the inclined retort line by Mr. T. E. Byrne and himself on the works of the Kings County (N. Y.) Gas and Illuminating Company.

A CORRECTION.—In our report of the proceedings of the last meeting of the Western Gas Association, as given in the discussion on the "Wrinkles" (June 3, p. 847), the last word in first line of par. 4, second column, should read "bead" instead of head;" and a like substitution should be made for the last word in par. 5. The first word in line 2 of par. 8 should read "plug" instead of "block."

"THE GAS-FITTERS' QUESTION BOOK, WITH ANSWERS.—We are in receipt of a copy of "The Gas-Fitters' Question Book, with Answers," which volume was arranged by Mr. Albert Dunbar, S. B., of the Dorchester (Mass.) Gas Light Company; and in that work the author was ably assisted by Mr. John Shuttleworth, also of Dorchester. If we mistake not, this work is the first of its nature to be printed in the United States; but whether so or not, we have no hesitation in saying that no gas fitting shop of any gas company in America can afford to do without it, even though in his preface Mr. Dunbar does say: "It must not be presumed that by studying this book one may become competent, and such is not the intention of the author. One's apprenticeship should be served in the shop, not in the library." The book, even if it is a bit elementary, is thoroughly practical and positively useful. It is handy in size, the print and binding are excellent, the text is clear and pointed, and it is altogether useful. It comes in two styles: Cloth, $1.35; flexible leather, $1.60.

NOTES.—Mr. C. W. Blodgett has been appointed Engineer to the Providence (R. I.) Gas Company.——Mr. John Dell, the President and General Manager of the Missouri Firebrick Company, of St. Louis, Mo., seems to be having his share of business in the gas trade, as the following recounting will show: It has just completed two rear-clinkering benches of 6's for the Manitowoc (Wis.) Gas Company, with Mitchell semi regenerative furnaces; five of the same style benches for the Covington (Ky.) Gas Light Company; and two for the Hammond (Ind.) Gas Company. Contracts on its books call for benches of the Mitchell furnace construction type for the gas companies at Grand Rapids, Ypsilanti and Pontiac, Mich.; Evansville, Ind.; Bloomington, Ills.; Houston, Tex.; Lawrence, Kas.; Marion, O.; and Windsor, Canada.

[OFFICIAL REPORT.—REVISED BY THE SECRETARY.—CONCLUDED FROM PAGE 931.]

PROCEEDINGS, TWENTY-FOURTH ANNUAL MEETING WESTERN GAS ASSOCIATION.

HELD IN THE GALT HOUSE, LOUISVILLE, KY., MAY 15, 16 AND 17, 1901.

SECOND DAY, MORNING SESSION—MAY 16th.

The proceedings of the afternoon session of the second day were commenced by the considering of the following

REPORT FROM THE MEMORIAL COMMITTEE,

which was read by Mr. Paul Doty, of Grand Rapids, Mich.:

Mr. President and Members of the Western Gas Association: Gentlemen—Our death roll during the year past has been unusually heavy, the following members having passed away: James M. Starr, Vice-President Richmond (Ind.) Gas Company, June 9th, 1900; Milton J. Payne, President Gas Company, Kansas City, Mo., July 17th, 1900; George Treadway Thompson, President Denver (Col.) Gas and Electric Company, October 1st, 1900; Herman Wilkiemeyer, Vice-President Evansville (Ind.) Gas and Electric Light Company, November 30th, 1900; Henry Ranshaw, President Stacey Manufacturing Company, Cincinnati, O., June 30th, 1900; D. L. Cathels, Superintendent Louisville (Ky.) Gas Company, November 30th, 1900; F. O. Ellsworth, Salesman, Chicago, January 9th, 1901. These notes have so far been prepared respecting the reco ds of the named deceased:

HERMAN WILKIEMEYER.

Our Association has sustained a great loss in the death of Herman Wilkiemeyer, Vice-President and General Manager of the Evansville (Ind.) Gas and Electric Light Company. He took an active part and did his full duty as a member of the Association in preparing papers and in the discussion of them. Our profession was made richer by his life, and we can only bow in submission to his death, and trust that when we receive the call to cease from work we may be found, like him, doing our duty.—JAMES SOMERVILLE.

MILTON J. PAYNE.

Colonel Milton J. Payne, who died July 17th, 1900, was one of the old settlers in Kansas City, Mo., dating from long before the "boom" times of that city. A large holder of real estate, he early became associated with the progressive element of the city, and a factor in its municipal and business life. He was for many years President of the Kansas City Gas Light and Coke Company, and when that Company absorbed the Missouri Gas Company he became President of the present Kansas City-Missouri Gas Company, and held that office until his death. * * *

GEORGE TREADWAY THOMPSON.

The pleasure we have usually felt in the anticipation of again meeting with our co-workers in the gas industry is on this occasion subdued by the knowledge that there is absent from our midst, one whose active, enthusiastic work has left an influence which will be long felt by the members of this Association, and one whose joy at meeting with us would doubtless have been greater than perhaps many of those who are here. It is hardly necessary for me to mention the name of the one to whom I refer, George Treadway Thompson, who passed away on the 1st day of October, 1900.

The gas industry, the Gas Associations, and particularly the Western Gas Association, are indebted to Mr. Thompson for much earnest work, when able to actively take part in their advancement, and warm personal interest when circumstances rendered it necessary to retire from active work. He brought into his work an energy and enthusiasm seldom equalled in one so young in his profession. Although actively connected with other Associations, his most earnest endeavors and best loyalty were toward the Western Gas Association, with which he became an active member at the meeting in 1888, 13 years ago. His first interest was with the Western Association, and it is perhaps for this reason that he felt a greater interest there than elsewhere. For a number of years he edited the Wrinkle Department and, if I remember correctly, was the instigator of that feature. He served upon the Board of Directors for 3 years, and in 1897 was chosen Second Vice-President. In due time he was elected to the Presidency, but during the year he was to serve his health failed to such an extent that he was unable to attend the meeting in Milwaukee, at which meeting he would have presided had he been able to be present. Those upon the Board of Directors and the Committee of Arrangements will remember his coming down from St. Paul to meet with us in Milwaukee in February of that year, staying for a couple of days, and of his taking

cold during that trip, which seemed to give him another setback. You will remember also the interest and enthusiasm shown at that time over the meeting to come, and his many expressions of interest toward having it one of the best meetings the Western Association ever enjoyed. I presume there was no occurrence during his long sickness that caused him more disappointment than his inability to be present and preside at that meeting. He expressed himself at great length and many times that it was one of the privations and disappointments of his lifetime that, having reached the height of his personal ambitions so far as Gas Associations were concerned, he was unable to preside over that meeting, and thus culminate in a complete way his connection with the Western Association.

His tender regard and deep interest in the Western Association were evidenced when, foreseeing the rapidly approaching end, in the shadow of the grim presence, he carefully prepared and catalogued his technical library, composed of about 150 volumes, and sent them to the Secretary of this Association. We shall hope that this munificent gift will prove an incentive to the Association, and that the Thompson Library will form a nucleus of a monumental memorial to its young and highly esteemed founder.

George Treadway Thompson was born in St. Louis, September 3d, 1869, and died on the 1st day of October, 1900, at the age of 31 years. He was the son of the late J. D. Thompson, for many years Secretary and Treasurer of the Laclede Gas Light Company, and a well known and active member of the gas fraternity. George Treadway Thompson was connected in various ways with men whose names were prominent in former years with the active and enthusiastic workers of the gas industry.

Receiving his early education in the public schools of St Louis, he entered Washington University, where, as in his later efforts in life, his persevering will and indomitable energy won him high honors.

After completing his education he became identified with the Laclede Gas Light Company. Having a natural aptitude for the gas profession, his advancement was rapid. Commencing as an apprentice, his pride and enthusiasm in his work and his interest and devotion to business gained for him rapid promotion; and, in 1891, about 4 years after entering the employ of the Laclede Company, he was appointed Superintendent of Station B. His courteous and considerate treatment of the men in his employ won him their confidence and respect. He would thoroughly investigate any charges made against his employees and was never known to treat any man unjustly. The marked success of his efforts at Station B attracted the attention of Mr. Emerson McMillin, who, requiring a capable and energetic engineer to supervise the affairs of the various gas properties under his control, appointed Mr. Thompson to this position, and in 1896 his headquarters were established in New York.

Naturally delicately constituted and of slight physique, in his insatiable appetite for work he undertook too many arduous duties A slight cold soon grew into a severe disorder, and July, 1898, found him forced, by order of his physicians, to give up his work in New York. Finding the bracing atmosphere of St. Paul of but temporary benefit, he sought the warmer influences of the Gulf, at San Antonio, Tex. Failing to recuperate here, in the early part of 1899 he went to Denver, Col. Mr. Thompson was possessed of redoubtable courage, and, in waging his heroic battle with death, never relinquished his interest and devotion to his profession, and shortly after his arrival in Denver was elected President and Treasurer of the Denver Gas and Electric Company.

Many of those present here know that Denver was selected as the place of meeting of the American Gas Light Association, in October last, largely as a testimonial of the love and affection of its members for Mr. Thompson, and to encourage him to some extent in his fight for life. For many of us the anticipation of again meeting our young friend added greatly to the pleasure of our trip to Denver, and when, on the morning of October 2d, about two weeks previous to the date of the meeting, the news reached us that George T. Thompson was dead, it was with deepest grief and universal sorrow we realized that our bright, enthusiastic and well beloved associate would not participate in the pleasures and benefits of our meeting. I am sure I voice the unanimous sentiments of the members of this Association when I say that we felt his death as a keen personal loss.

Possessed of an unusually brilliant and gifted mind, the briefness of his career leaves much to be regretted. While successful to a marked degree in his chosen profession, his versatility in other spheres was well known. His efforts submitted at various times in our Association work gave promise of unusual talent in literary work. His poetic tendency was well known among his friends, and many of you present will doubtless recall the poem composed by him and read at the Western Association banquet in Milwaukee, Wis. In the many ways and for the many reasons that have been mentioned will the memory of George Treadway Thompson remain with the members of the Western Gas Association for many years.—E. G. COWDERY.

A SECOND TRIBUTE TO THE MEMORY OF MR. THOMPSON.

It is a natural desire that we, the members of the Western Gas Association in formal assembly, now give expression to the feeling of sorrow we have in our hearts. These meetings, these milestones, remind us only too well of the transient life.

When, in October last, there came from Denver the message, "George Treadway Thompson died this morning," our heart-beats stopped, and our sympathy went out with loving remembrance to the bereft mother and the stricken family, and whatever there was of comfort in message of condolence we gave quickly.

By reason of the convention of the American Gas Light Association, in Denver, in October, gathered in part as a tribute of affection for Mr. Thompson, there was presented to this sister Association the opportunity of first recording a tribute to his memory, and of first presenting a special resolution of regret for his death and of giving expression of condolence to his family. Ours is now the privilege of planting in this Springtime season the rosemary for remembrance, and with each recurring Maytime there will be a new birth of hope and love from the inspiration of his life's work. It has been said his greatest interest, his hardest work was given towards the success of this Association. His record of unselfish work, his papers, his successful administration of the offices to which he was chosen by your favor, even to the Presidency of this Association, all bear testimony to his love for us. And his library, his companion of his hours of study, he has added as a lasting gift for the welfare of his fellows.

Our sister Associations have incorporated in their proceedings the record of his early life, his education, achievements and brilliant promise. Mine it is now the privilege to give voice to the sorrow we all share, to speak as his friend, even as you might all speak; for who was not his friend that knew him? Gifted he was with the subtle quality known as temperament, with ready wit, quick perception and graceful tongue, his were attributes to touch the heart, and make one wish to call him friend. His sun set ere it was noon, and the "Bustle of man's work time" shall know him no more; but we who knew him and honor the good and true in him, cherish his memory.

"Yon rising moon that looks for us again—
How oft hereafter will she wax and wane;
How oft hereafter, rising, look for us
Through the same garden—and for *one* in vain;
And when like her, O Saki, you still pass
Among the guests star-scattered on the grass
And in your joyous errand reach the spot
Where he made one—turn down an empty glass."—PAUL DOTY.

Respectfully submitted, PAUL DOTY, E. G. COWDERY, JAS. SOMERVILLE, } Committee.

The President—The formal minutes to the memories of our other deceased brethren will in due time be submitted for the records. In the event that some of our members were on pretty close terms with any of the named deceased an opportunity will now be given for the recall of the many good traits possessed by different individuals.

Mr. Enright—Mr. President, I had the pleasure of knowing several of the deceased, and especially so respecting Mr. Thompson. Mrs. R. N. Crandall, a sister of the late Mr. Thompson, requested me to thank the members of this Association in her name for all their many kind acts. I am only sorry you, gentlemen, have not the pleasure of receiving thanks in person. It is a great deal of pleasure to me to meet this lady, as I frequently do. She called at my house on last Sunday and requested me to make her acknowledgments. Of course, I am honored in so doing, and the resolutions will no doubt reach her as well as the balance of the family.

On motion of Mr. Somerville, the report of the Committee on Memorials was concurred in by a rising vote.

The President called for the

REPORT OF THE COMMITTEE ON PUBLICATION OF PROCEEDINGS,

which was read as follows by Mr. O. O. Thwing, of St. Louis, Mo.:

To the Western Gas Association—Gentlemen: Your Committee on Publication of Proceedings has to report that, owing to the fact that the reports of the Proceedings of the Association for the years preceding 1891 could be obtained only by transcribing from the private files of the AMERICAN GAS LIGHT JOURNAL, the publication of the 3d volume has been very considerably delayed.

The transcripts of the proceedings of the years 1887, '88, '89, '90 and 91 have been prepared, and the copy is practically ready for the printer.

Your Committee hopes to be able to include the Proceedings of 5 years in the next volume; this to be followed by a 4th volume embracing the years 1899, 1900 and 1901.

The thanks of the Committee and of the Association are due the AMERICAN GAS LIGHT JOURNAL for prompt and willing assistance in furnishing the Committee with typewritten copies of the official reports of the meetings of this Association prior to the year 1891.

O. O. THWING,
WM. MCDONALD,
ALTEN S. MILLER, } Committee.

Mr. William McDonald—I don't think it is any more than fair in this Association meeting to say that Mr. Thwing has done this work. We have said it before. The other members of the Committee, Mr. A. S. Miller and myself, have done very little if anything towards it. I want it known by the members of the Association that Mr. Thwing is doing the work, and I know you all appreciate the way he is doing it.

On motion of the Secretary, the report was received and the Committee was continued another year.

LETTERS OF REGRET.

The Secretary here read many letters expressing the regret of the writers at their inability to be present at and share in the proceedings of the meeting. The letter that brought out the heartiest round of applause was the following:

SAN JOSE, CAL., May 4, 1901.

Mr. James W. Dunbar, New Albany, Ind.—My dear Mr. Secretary: I am in receipt of your kind favor of April 23d. My inability to attend the Louisville meeting is a serious matter to me, I can assure you. I have been looking forward to that pleasure for the last 12 months, and it is with the greatest reluctance that I am compelled to abandon the idea of exchanging greetings with that body of the best fellows on earth, viz.: The members of the Western Gas Association. "Hope springs eternal," however, and I am already praying for better luck next time. I shall not indulge in the stereotyped formula of wishing you "a pleasant and profitable meeting;" for when was the Western ever known to have anything else?

Give my very fondest regards to everybody, from President Copley down to the freshest and rawest recruit, laying a slight special stress in its fervor, however, on some of the members of the "Old Guard," such, for instance, as "Uncle" Jerry, "Hite" Barret, Fred. Persons, John Dell, B. E. Chollar, "Dan." Russell, Geo. G. Ramsdell and his twin brother "Billy" McDonald, to say nothing of others too numerous to mention. Yours sincerely, A. W. LITTLETON.

APPOINTMENT OF LIBRARY COMMITTEE.

The President named as members of the Library Committee, Messrs. Wm. McDonald, F. H. Shelton, O. O. Thwing.

At the request of the President the

QUESTION BOX

was opened. The first question read by the Secretary was:

"What pressure at the burner gives best results with the Welsbach or Kern lamp?"

Mr. Norris—I would say, on general principles, the higher the better.

The Secretary—The person who propounded this question thought there was a possible limit, and wanted to know what that limit was.

Mr. A. E. Forstall—The highest pressure I ever heard of being used with the Welsbach burner is 50 inches, and the man who is using that said he would go higher if he could.

The second question read was:

"What pressure at the burner gives the best results with gas stoves?"

The President called upon Mr. F. D. Moses for a reply.

Mr. Moses—Two inches is about the best pressure I have found. We can get very good results on 6-tenths at the burner; but 2.24 inches I generally carry. That gives plenty of gas. They will run fairly well on 1 inch or less.

The third question was:

"Has anyone observed the difference in fireclays as to their ability to transmit heat waves?"

The President called on Mr. Doty, who said he had no information on the subject.

The fourth question was:

"Is a refractory test of fireclays any essential indication of their desirability for use in the manufacture of retorts?"

The President asked Mr. Somerville to reply.

Mr. Somerville—I do not quite get hold of the sense of the question, because fireclay is a refractory material, and retorts are made of fireclay. I think perhaps the question should read, is a high percentage of silica essential in a clay for the manufacture of retorts? I would answer somewhat in the negative. I don't know that it is, and it is very hard to determine what is the proper percentage of silica. It is generally left to the manufacturer of retorts, after long experiment, to determine the proper mixture of alumina and silica, and the amount of iron allowed. I don't know whether it is pertinent to the question or not, but in my experience I like a well burned retort, not necessarily a dense one, rather porous, or one that will give a sort of ringing sound when struck with a hammer. I prefer that kind of retort.

Mr. Thwing—It is my experience that the larger amount of burned material that can be contained in the retorts and be held together by the new fireclay the better the retorts are. Retorts so fragile that they can hardly be handled into the benches are able to stand the heat of the benches better than others that are seemingly stronger. It is the burned material that is used in the retorts that gives them refractory power.

Mr. Somerville—If you have too much of the burned material the retort is very difficult to handle; and in letting down the benches on cooling they are very apt to crack. One with a very little more fireclay is apt to stand better than one with a larger amount.

Mr. Thwing—It is necessary to have enough clay to hold it together. We are very fortunate in having patchers who are able to build a retort if the hole is left.

The fifth question was:

"Is it good policy to charge meter rent where no gas is consumed for say three months in succession?"

Mr. Egner—I would say, "yes."

Mr. Jenkins—I would say it was better policy if you do not have to serve a meter at all under those conditions.

The sixth question was:

"Would the teaching of our gas consumers to read their own meters, to determine the amount due for the gas consumed each month, have a marked tendency in removing the prejudice against gas companies which seems to exist everywhere?

Mr. Pratt—I would say, "yes;" anything that will educate consumers to understand what they are doing with gas consumed I think is beneficial to the company.

The President—Is it not one of the commendations of the slot meter that the consumer knows what he is doing?

Mr. Odiorne—I think it is just the opposite; the consumer doesn't know what he is doing with a slot meter, in my experience.

Mr. T. D. Miller—A little learning is a dangerous thing, and I have observed that those who thought they knew how to read their meters, but did not, make trouble. Those who do know how don't make trouble.

Mr. Runner—Our experience is that people who know how to read the meter watch it from time to time during the month. They don't wait until reading time to see what they are doing. We have no trouble at all with that class.

Mr. Odiorne—We find that a man who will take the trouble to read his meter and read it properly and correctly never has any objection to make. Understanding just how much he has burned, he knows just what his bill will be before he gets it, and settles his account without any objection whatever.

Mr. Somerville—My experience goes to show there is no trouble that has paid me so well as that of teaching consumers how to read their meters. I was always glad to do it. I never had trouble with a man who could read his meter.

Mr. Pratt—I remember in a New England Association meeting several years ago this question was being discussed, and after giving it considerable attention it was decided that in all probability the best method of handling the consumer in connection with the meter was to have the meter made as ornamental as possible—ornamental enough for a piece of furniture—and instead of hiding it in some dark corner of a cellar, that it be suspended in the front hall, so that when paterfamilias came down stairs in the morning the first thing to attract his attention would be the gas meter, and by consulting it he would know how much gas had been consumed the day before, from which standpoint there would be no complaint.

Mr. Enright—The question is about as the one we had yesterday, only in another form. I think you will agree with me when I state

that the reading of a meter is a very simple thing, and that you will also agree with me when I say a large majority of the people, for some unknown reason, believe that the reading of a meter is a great mathematical problem, and that when they do know how to read it they are simply astounded at its simplicity. The question comes up very frequently in regard to a gas stove as to what will it cost to do this that and the other with them. We take special pains to teach every one to read his own meter where we have a gas stove, and I must say I have never done anything else that brought about equally good results. With all our boasted advancement in the way of education we do not possess anything in this line. I have met some fellows who claim to be college professors who had some doubt of their ability to read a gas meter. Children are taught to tell the time of day or read the face of a clock or watch by the time they are 5 or 6 years old. I never have heard of anybody teaching a child how to read a gas meter. As Mr. Odiorne said, it is one of the best things I have ever undertaken and have never had any trouble with the consumer who keeps his own account of the meter's correctness.

Mr. Egner—About 20 odd years ago I invented a meter by which you could tell the cost of the gas consumed, in progression from 10 cubic feet up, and you could change the arrangement for a change in the price of gas at about 2 cents per meter. I felt myself getting rich. I had one meter made and went on to New York to sell the patent rights, and saw the Presidents of several gas companies. I thought of let ing them off easy. I would sell them the right for the City of New for $100,000. After getting that, I would not care very much to get more, but they didn't buy it. I spent $900 on that invention. My President, then at Norfolk, Va., thought it a valuable invention. I had a dozen meters made. The AMERICAN GAS LIGHT JOURNAL illustrated it, and so did the *Journal of Gas Lighting*, and did not charge me anything for it. The *Scientific American* illustrated it and charged me $40. I had one of the meters put in my house and another in my President's house in Norfolk, Va. They worked first rate. The Company advertised in the local papers that a meter by which consumers could tell the amount of gas consumed to the value of one penny could be had by applying to the City Gas Lighting Company. Nobody applied. A patent was issued for 17 years, and it was all my own for the whole term, and that is all there was to it. This will be a good item for our new editor of the "Wrinkle Department" to put in his pamphlet next year.

The seventh question was:

> "Does it pay to vaporize oil before entering the oil to the generator or carburetter?"

The President called upon Mr. Thwing to reply.

Mr. Thwing—I think the class of oil that the gas people are getting at the present time could not be completely vaporized anyway. You can vaporize it when you get up to 900° or 1,000°, but you are certainly going to lose, besides having coke left in the vaporizer. You can heat it. I believe it is a good thing to heat it as much as you possibly can, but as far as vaporizing is concerned I draw the line.

The President called upon Mr. Norris.

Mr. Norris—I don't think it is possible to get a general answer to that question. I think it depends on the oil you are using, the generator, the fuel you are using and the heats you are trying to carry. I think certain oils you cannot vaporize. Simply as a heat proposition, the hotter you get your oil before it goes into the carburetter the less heating you have to do afterwards. Some of the most successful results are gotten with coal oil.

Mr. T. D. Miller—If my friend will agree not to say anything about my advertising Texas, I will say, in the Corsicana oil which we get, and which we introduce into our carburetter at about 310° to 315°, 10 to 15 per cent. of it is vaporized when it gets in there, and undoubtedly we get that much benefit from having it that hot. Of course, where you have oil that doesn't begin to boil until it gets above 300° you won't get it hot enough to vaporize.

Mr. Thwing—I have in mind a case in which oil was heated quite highly and the candle power, that is the candles per gallon, was very unsatisfactory. When the process of working was changed and cold oil was injected into the carburetter, the candles per gallon were increased very considerably. The cause of it was that the vaporized oil that was sent in at first was transformed into lampblack, while the oil going in as a liquid, cold, prevented the oil from being changed into lampblack.

Mr. T. D. Miller—I will say in connection with this Corsicana oil, some water gas plants have a regulation that the superheater stack-valve must roar in order to have the proper heat in the superheater. If we have our superheater so hot that it roars, we are making naphthaline very rapidly.

The eighth question was:

> "What is the best way of vaporizing the oil? To what temperature should the oil be raised?"

The President asked Mr. Norris to reply.

Mr. Norris—The indefinite answer I gave before is the best I can do on this. As far as vaporizing the oil is concerned, I think the best place to vaporize oil is in the carburetter. That is about as efficient a way of doing it as any auxiliary apparatus.

Mr. Egner—I think here is a grand opportunity for one of our members to show he knows more than we think he does perhaps. Mr. Frank D. Moses knows how to sell gas stoves, and he is an expert builder of water gas apparatus besides.

Mr. Moses—That would depend on the oil you are using. If you use naphtha you don't want to vaporize it very much. If it gets too hot you get naphthaline. We use it alone. Our oils are ordinarily steam heated. Then they go right into the carburetter. We have very little tar or lampblack. I don't think you can vaporize a light oil before putting it into the carburetter. If you do you will burn it. If you can warm it up that is all you need to do, then put it in the carburetter. I would not heat naphtha at all; I would put it in cold.

Mr. Norris—I think very often the question of whether or not oil should be heated is complicated by the fact that oils contain constituents which boil at different temperatures, and where you have a heater with a large amount of heating surface and raise the temperature to a high point, you are liable to get what we call "gulps" of vapor first, then oil, and then vapor, and the result is that the spray will not spray efficiently; if it is properly set for vapor, it is not properly set for liquid oil, and vice versa. This is one reason why when the heater is by-passed you sometimes get better results because with cold oil you get a very much more even distribution of the oil in the carburetter. I think if you could get good distribution with heated oil the balance would show up in favor of the hot oil.

Mr. Thwing—There is probably a misconception in this matter of vaporizing oils. The only vaporizer that I know of is used with the retort system of water gas enriching. The only oil that I have used there successfully is naphtha, although I understand they use other oils in Brooklyn. The vaporizers with which I have been familiar are very nearly as large as a bench of 6's, and used live steam for vaporizing at something like 135 or 140 pounds pressure, making the temperature considerably over 300°, and required those large vaporizers. The small heaters used in ordinary Lowe gas apparatus at the present time are not vaporizers; they are simply heaters.

Mr. D. McDonald—Does anybody ever vaporize oil in a water gas apparatus? You heat it way above its boiling point, but you heat it under pressure and, of course, it cannot boil. If the sprays are set for oil, they would be much too large for vapor. Does anyone ever put his oil into water gas apparatus in the shape of vapor? If so, what size of pipe does he require. A cubic foot of oil would make about 1,000 cubic feet of vapor. It would require a very much larger pipe. I have never seen a water gas apparatus that actually vaporized its oil. I have seen a great many heating it under pressure far above the boiling point.

Mr. T. D. Miller—I would say heating under pressure might not vaporize it until the pressure was relieved.

Mr. D. McDonald—It would not vaporize then; don't forget the latent heat.

Mr. T. D. Miller—It would certainly vaporize very quickly after the pressure is relieved.

Mr. D. McDonald—Not until it has absorbed a great deal more heat. Heat 100 gallons of oil, under pressure above the boiling point, and release the pressure and 5 gallons will spring into vapor, and in doing so will lower the temperature of the balance. What I ask is, does anyone know of oil being carried into a water gas apparatus in the shape of vapor?

Mr. Thwing—They do in retort systems.

Mr. D. McDonald—I said in water gas apparatus.

Mr. Thwing—That is water gas apparatus that vaporizes naphtha, and it is carried forward with blue gas and forms vapor.

The ninth question was:

> "What is known of the Dellwik-Fleisher water gas process? Has it been exploited in this country?"

The President called upon Mr. Norris to answer the question.

Mr. Norris—As far as I know it has not; but the basic principle of the so called Dellwik process is used every day by every man who runs

an ordinary Lowe water gas apparatus. It is a question of the proportion of carbonic acid and carbonic oxide in the blast gases. Dellwik claims that he gets a very large proportion of carbonic acid in the products of combustion, and so gets a large proportion of heat in his fire. An ordinary water gas apparatus, during at least part of the blow, gives blast gases which contain more carbonic acid than Dellwik gets in his process.

Mr. A. E. Forstall—It wants to be clearly understood that the Dellwik-Fleisher apparatus is an apparatus for making blue gas only. If carburetted gas is wanted there must be other plant apart from the Dellwik apparatus for carburetting the gas. It simply takes the place of the generator of the ordinary carburetted water gas apparatus. As Mr. Norris said, Mr. Dellwik's claim is that by proportioning properly the pressure and the amount of blast and the depth of the fuel, he succeeds in producing a blast gas, which is practically an inert gas composed of nothing but nitrogen and carbonic acid. There has been a very interesting series of articles in the *Journal of Gas Lighting*, which reprinted them from the *Journal für Gasbeleuchtung*, by Drs. Jahoda and H. Strache. They claim that Dellwik is barking up the wrong tree, that his principle is entirely wrong, that the production of carbonic acid in the blast gas has nothing at all to do with the proportion between the pressure and the amount of the blast and the depth of the fuel, but is simply a question of temperature of the fire, and that any water gas apparatus, no matter what the size of the blast pipe, or pressure of the blast, or depth of the fuel, if the temperature is kept low, will make gas which will not contain any carbonic oxide, while if the temperature is run up even the Dellwik apparatus will give carbonic oxide. They made an elaborate series of experiments testing the compositions of the gases with a great many rates of blast, and also testing the water gas produced for a great many different rates of steam, and the result of all these investigations is that it is purely a question of temperature. Dellwik by the short blast keeps his generator at a very low temperature, then allows only a small quantity of steam to go in, so that while the generator temperature is low he still makes a fairly good water gas. The efficiency of the Dellwik apparatus is no greater than the efficiency of any other water gas apparatus. Of course, it is only fair to say that Strache has a water gas process of his own, but his results seem to be very carefully worked out, and seem to be worthy of belief.

Mr. T. D. Miller—I saw an account of the Dellwik process in which they blasted with about 12 inches of mercury pressure, but they claimed to get an efficiency of 85 per cent. from the fuel, while ordinary water gas possesses only about 45 per cent. from their statements made.

Mr. Moses—It may be interesting to note that the Dellwik process originated in this country. Mr. Dellwik, I believe, experimented for several years in Chicago. He made a very good blue gas from soft coal, running at low temperatures, and got a good deal of coal gas from the coal. They ran that, I think, two or three years on blue gas. Mr. Dellwik then went back to his native country and brought his process out. I think it is the same process he had on trial in Chicago in 1891 or 1892.

Mr. Egner—I want to state the results claimed by the Dellwik people, which would make this discussion perhaps more intelligible to some of the members who are not familiar with it. They claim to use 32 pounds of coal to 1,000 cubic feet of blue water gas. That is their claim, including fuel and steam, and if that is true anyone can figure out what it is worth.

Mr. A. E. Forstall—The best figures I have seen as to the efficiency of the Dellwik water gas apparatus, the figures that seem most reliable, are that they get back in available heat units 78 to 80 per cent. of the heat in the coal that is originally used. Now, I think as Mr. Glasgow figured out the efficiency of carburetted water gas apparatus, it was fully as good as that, perhaps a little better, so there is really no very great improvement in their claimed result.

The President introduced Mr. Ernest William Bell, of St. Louis, Mo., who read the following paper on

PREPAYMENT METER ACCOUNTS AND RECORDS.

The following method or system for keeping records and accounts for prepayment meters is submitted at the invitation of your Executive Committee, who desired a paper pertinent to this subject at this 1901 meeting. It has proved successful in conducting from its inception a department operating over 5,000 meters.

The endeavor has been to supply a system whereby accurate, comprehensive, rapid, economical and systematic shop and clerical work could be accomplished, and to fill these requirements the use of the card index and loose-leaf ideas is contemplated.

These ideas are now generally well known and understood; however, it might be well to briefly explain them. In the loose-leaf system, ledger accounts and records of work are posted on loose leaves or sheets, which are filed in specially made holders or binders. These binders resemble an ordinary book and are provided with locks which insure the safety of the leaves filed. In the card index system, memoranda are made on cards of uniform size, which are filed on their edges in a drawer designed to hold them, the several division or classification heads being denoted by means of guide cards. In either system the leaves and cards are filed in their respective drawer or binder alphabetically, geographically, according to dates, or otherwise to suit the purposes of the record. New cards and leaves are quickly inserted in their intended places, and all dead matter is as speedily taken out. The blanks or forms designed for this system are described as follows:

1. Applications and orders to set, remove, change or transfer meters or appliances are made on cards, upon which are printed the gas company's terms, rules and regulations, which are subscribed to by the parties giving the order. On the reverse side of these cards spaces are provided in which to note the applicant's previous record as a gas or electric consumer, the deposit or guarantee required, and other miscellaneous remarks.

2. Work tickets for the execution of the above orders, complaints and sundry order tickets are also printed on cards, spaces being provided for noting all the desired data, such as: Consumer's name and address, the order given, the date and hour and name of clerk giving same, the size, maker, number and register of meter, supplies used and labor employed, date and hour and completion of order, and the name of employee executing the work. The size of the cards is 3 by 5 inches.

3. Daily record sheets are provided, on which to record the daily work of the department, as shown by work tickets described above. These sheets are 17 by 22 inches, and contain 50 horizontal lines upon which to enter 50 work tickets—a line for each ticket. The vertical lines are so ruled as to furnish a column for each item on the work ticket. The horizontal lines are numbered and the number of the line on which a ticket is entered is placed on the ticket.

4. For the consumer's ledger loose leaves are supplied. These leaves are ruled to provide columns for date of taking meter statement and collecting money, statement of meter, consumption in cubic feet and amount of money collected. At the top of the page blanks are printed for meter information and the name and address of customer. The leaves have no folio number, the idea being to use the house number as the folio. The size of the sheets is 8½ by 11 inches.

5. Meter route books are also loose-leaf books, the leaves of which are printed in a series of 12 coupons. Each coupon has blanks for the house number, date of registering, register of meter and money collected. At the top of the slip consumer's name and address and meter information are recorded. The size of slip is 3 by 11 inches, the coupon being 3 by ⅝ inches. In addition to meter slip, other coupon slips are provided, to be placed in the back of the meter book. These coupons are 3 by 5 inches, two to each slip, and are used by the register man in reporting complaints or other troubles encountered on his route.

The routine employed in conducting the work of the prepayment meter department in connection with the forms above described follows along these lines:

Applications and miscellaneous orders having been received at the office, the clerks make the requisite investigations and, if orders are correct and acceptable, issue the order for the execution of the work on the proper work ticket. The original order is then filed temporarily, and the work ticket forwarded to the shop. The shop clerk, upon receipt of the tickets from the office, assorts them into the most advantageous routes for execution. They are then entered on memoranda sheets and the tickets assigned to the proper workmen.

The workmen having completed the order make full report of the work by filling out concisely all the spaces on the ticket. The ticket is then returned to the shop, when the shop clerk checks each ticket on the memoranda sheets. The tickets are then assorted according to the class of work, such as meter work, complaints and appliance work, and each class is then entered on its respective daily record sheet. These sheets are made in duplicate, by means of carbon paper, the original to be sent to the office and the carbon copy to be retained at the shop. The work tickets are then filed in a card index drawer alphabetically according to streets and numerically according to house numbers, and the daily record sheets in their proper binders according to dates.

The daily record sheets arriving at the office are sent to the clerk who issued the original orders. He then checks up the orders by placing the line number of the record sheet upon the corresponding

original order card. The card is then deposited permanently in a drawer, alphabetically, according to the name of the consumer. The meter work record sheet is then sent to the consumer's ledger clerk, and the others are filed in the proper binder.

The ledger clerk receiving the meter work record sheet, makes out new loose-leaf ledger sheets for all new consumers acquired, and inserts them in their proper places in the ledger binder, he also extracts the leaves for the meters removed. The extracted leaves are filed in a separate binder for probable future reference. In like manner the shop clerk keeps up the meter route-books from the carbon copy of the meter work sheet. The leaves in the ledger and the slips in the meter route book correspond as to their arrangement, being inserted numerically according to the house numbers. The route-books are arranged for a day's work, and contain from 125 to 150 slips, and the ledger with about 450 leaves.

In collecting the money from coin boxes and taking meter statements, in depositing the money in the office, and the ledger posting, the following method prevails :

The shop clerk having the route-book checked and corrected to date, issues the books to the route men, and at the same time provides each man with a coin bag and padlock key. The men in securing contents of coin box, count and examine each coin carefully, and note the amount collected and the meter statement on the proper slip and coupon. In the event of finding mutilated, smooth or counterfeit coin, or metal slugs, the route man immediately reports the fact to the consumer, who as a rule redeems such with good money, but if not redeemed he remarks the refusal on the slips in the back of the route-book for the information of the ledger clerk. Finishing his collection the route man proceeds to the office where he turns in his book and money collected, receiving a receipt therefor. He then proceeds to the shop where he returns his coin bag and key and makes report to the shop clerk the amount of his collections.

The teller adds on an arithmometer the entries in the meter book ; the total should agree with the money turned in. The totals are entered in the teller's blotter and the arithmometer slip sent to the auditor.

The route-book is sent to the ledger clerk who posts the entries properly in the ledger. He then takes off the balance sheet which shows the cubic feet of gas consumed, amount of money collected, the number of meters in use and other detailed information as shown on the books. The ledger clerk also secures the memoranda tickets and immediately issues whatever orders are necessary and proper. After posting entries from the route-book the coupon is clipped from the slip and filed for reference.

In reviewing the foregoing, the utility and value of the system can be clearly understood. It will be seen that the scheme provides a system which completely records and indexes all the work of the department and insures a thorough audit or check for all ledger accounts. The work tickets and application cards furnishing a cross index, and the daily work sheets recording completely all the work accomplished, make it possible to secure any desired information concerning the department quickly and in a detailed manner. The audit for ledger accounts is thorough for the reason that the teller, shop clerk, route man and ledger clerk make separate records and reports, each checking against the other. The company's storekeeper's meter stock report checks the entry of leaves in the consumer's ledger and in the meter route-books.

Discussion.

The President—You have heard Mr. Bell's paper bearing on a subject which has engaged the attention of many of us. We would like to hear from the man who has the largest number of slot meters in use.

Mr. Butterworth—We have only a few, and wish we did not have those.

Mr. Odiorne—Why does Mr. Butterworth not like them ?

Mr. Butterworth—Because they are so much trouble. Being frequently broken open and robbed, we lose money by them, and we get practically the same business without them.

Mr. Moses—Twenty per cent. of our meters in Camden, N. J., are of the prepayment sort. The people insist upon having them. We are opposing their placing all the time. When we got them started everybody wanted them. We made a rule in the last month that the use of at least $1 worth of gas must be guaranteed per month before we will place one. The minimum for ordinary meters is placed at 50 cents per month.

In response to an invitation from the President, Mr. E. G. Pratt said : I have littte to say on this question. I think the topic is very carefully covered in the paper by Mr. Bell. As already suggested, the prepayment meter business is getting to be a good deal of a nuisance. If we could control it to the extent of serving the prepayments to such people as we would like, it would be all right, but customers whose credit is undoubted, and who have been on our books a great many years, make demand for prepayment meters, and try to work the "bluff" that if they cannot have a prepayment they do not want any. We have come pretty near to that point where we expect to draw the line for the purpose of trying to stop extending their use.

Mr. Baehr—Our experience in Denver coincides very nearly with that of Mr. Pratt. It seems the old company bought a lot of about 25 prepayment meters as an experiment. When we took hold of Denver the people had seen a few of them and everybody wanted prepayment meters. We have sent out about 125, and we are very sorry we did. Mr. Doherty I know is also opposed to them.

Mr. T. D. Miller—I want to say in justification of the prepayment meter that we have a man who is burning $5 to $10 worth of gas a month to whom I would not supply gas through an ordinary meter. He owed us a back bill and would not put up a deposit. I think we might better get good money out of him than to reject it, because we had some bad money that we did not get from him. I know that we have on our books 100 consumers who are bringing us in $300 to $400 a month that we would not have with anything but prepayment meters. We have probably 100 consumers that we would not have on anything else, because we believe they would deliberately stick us for a bill. Our losses from prepayment meters through robberies are nothing like our losses from bad bills with the ordinary meter.

Mr. Pratt—I think if you would add to that the additional cost of prepayment meters, taking into consideration your losses if ordinary meters were used, you would find possibly that the losses were less than the additional cost of prepayment meters. I would not undertake to discourage the use of the prepayment meter. I think many of us are working with many classes of people, some of whom are very useful ; but one has to control the use of prepayments. We started with only a few prepayment meters, and we now have over 2,000 of them out. It is a good deal of a nuisance to have so many in service.

Mr. T. D. Miller—Is it not a fact that the best gas stove consumer you can get is the modest home where the work is done by the mistress of the house ; and in most of those cases, is it not impossible almost to get them to put in a stove unless they can pay for the gas in advance ?

Mr. Pratt—Yes, sir ; the prepayment meter certainly appeals to that class of people, as I have expressed myself before about the gasoline stove with a 5 gallon can of gasoline. It is paid for in advance, and the price of it is not taken in consideration so much as though it came up in the form of a bill at the end of a month. I agree with you on that proposition, but the question now is what we are to do to control it, because it is certainly creating some friction and some displeasure among people who have used gas for years, and whose credit is undoubted, and who have always paid their bills promptly, yet conceive the idea that it is cheaper for them to have a prepayment meter.

Mr. Runner—Our experience in prepayment meters with the poorer class of customers is that they pay us very much more. All our saloons and those that are slow in paying bills are on prepayment meters. The consequence is we do not lose as much in a year now on our gas bills as we did in a month previously. One point on which we find the prepayment point works very advantageously is with the housekeeper who has extravagant or careless hired help—people whose gas bill amounted up to $7, $8 or $9 a month. They would say they simply could not burn gas any longer under the circumstances. They liked the gas stove and did not want to give it up, but they could not afford it. We put in a prepayment meter as the last resort to hold that customer. His bills will now run from $4 to $6 a month, and he is perfectly satisfied.

On motion of the Secretary, a vote of thanks was tendered to Mr. Bell for his paper.

The President called for the

Report of the Committee on National Advertising Bureau,

which was read by Mr. E. G. Pratt, as follows :

I want to say in advance that this report is simply one of progress. As you know the Ohio Association named a committee to look into this matter and report, appointing Mr. Henry L. Doherty, and the American Association has appointed Mr. Frank D. Moses to represent it. Unfortunately the committee representing the different Associations has been unable to get together. It had been hoped it would assemble during this meeting to enable me to formulate for this Association a

better report, so that the one which I will read is simply a report of progress.

At the meeting of this Association, held in Chicago one year ago, the undersigned was appointed a committee representing this Association, to co-operate with Mr. Henry L. Doherty, representing the Ohio Association, for the purpose of formulating and presenting to this Association plans that would secure for its members more effective methods and results in advertising. Subsequently, at the meeting of the American Association, held at Denver last October, Mr. Frank D. Moses, of Trenton, N. J., was made a committee representing that Association. The committees representing the three Associations mentioned have had no opportunity of getting together or communicating with each other, except by letter. You have undoubtedly read the report of Mr. Doherty before the Ohio Gas Light Association, and have noted that inquiry into the subject only adds enthusiasm, and your committee, having taken pains to talk and correspond with members of the Association and the representatives of gas consuming devices, has concluded that, in his judgment, the best results can be secured to gas companies by extending, in a general and systematic way, the present methods of advertising. We have concluded that, while local advertising has been an effective means heretofore for keeping before the public in our respective communities the uses of gas, yet we believe that such work can be made much more effective by employing, or having under our control, an individual or individuals who will make the matter their specific business, and from whom will emanate such advertising matter as will be much more beneficial than could be expected by former methods, and prepared, as is generally the case, by those of us who have neither the time, disposition nor taste to prepare such matter. Several plans have been suggested. The two most important, however, we believe are :

First, the employment of a person or persons, having under his or their control the preparation of all advertising matter, he or they to be compensated by the combination of the Associations. All printed matter and cuts to be copyrighted, and to remain the property of the Associations.

Second, to contract with some advertising concern who will prepare and distribute for us such advertising matter as in their judgment, and by their experience, seems best, under the possible direction of someone appointed from the Associations.

Up to the present time we have been unable to obtain any definite figures as to the cost of such advertising, but have concluded that a fund of $50,000 is as small an amount as we could reasonably expect to start with, this fund to be contributed to by gas companies represented in the Associations, said gas companies to be assessed pro rata, according to the population of the city or district supplied by them with gas. Each company so contributing would then have all the benefits produced. By this means it will be seen that the advertising of the use of gas for light and fuel would extend beyond an immediate locality and education as to its use become general.

The agent or bureau established by the Associations would secure the best talent obtainable for the preparation of advertisements, and, by means of the press clipping bureaus, would get all advertisements of a unique description that might be used to the interest of gas companies, the idea being that this matter could be furnished to subscribers to the fund at cost price; anyone not subscribing having to pay an advanced price should they desire to use them. Gas managers would send to such bureau daily and weekly copies of advertisements designed and used by themselves, and other matters of interest, copies of which would be sent to each subscriber, exchange being made in this way of cuts, etc., as well. This advertising would be of proportionate benefit to all gas companies and gas stove manufacturers in the United States and Canada and should command the support of every one of them.

It has been suggested that the ideal plan would be to combine the use of both local and national publications : "That it is quite possible to map out a plan of local educational work as would be far more effective in increasing the consumption of gas than would be possible for the gas companies, if acting independently, and yet leave in their hands ideal and special advertising sufficient to keep them directly in contact with their local publishers, and quite probably this combined method of advertising would increase their value to and influence with the local papers."

It is understood that the committees from the different Associations are to, and should, meet in the near future when they will lay out a definite line of action and be able to make, in more definite form, a more complete report. This is offered simply as a report of progress.

Respectfully submitted, EDWARD G. PRATT.

On motion of Mr. Enright the report was received and the committee continued.

Mr. E. E. Witherby thereupon read a report from the Committee on Municipal Ownership, which was accepted. On motion the thanks of the Association were tendered to him for the work accomplished.

REPORT OF COMMITTEE ON FINAL RESOLUTIONS.

The Committee on Final Resolutions submitted the following report which was, on motion of Mr. Steinwedell, received, adopted and placed on file :

To the Members of the Western Gas Association—Gentlemen : Your Committee on Final Resolutions beg leave to submit the following :

The thanks of this Association are due to Messrs. A. H. Barret, D. McDonald, John Long and Jas. W. Dunbar, the Committee on Arrangements, who have so ably provided for the comfort and entertainment of our members throughout this meeting, and who have contributed so materially toward its success; and also to the President, Mr. I. C. Copley, and to our Secretary, Mr. J. W. Dunbar, for faithful and courteous performance of all duties incumbent upon them.

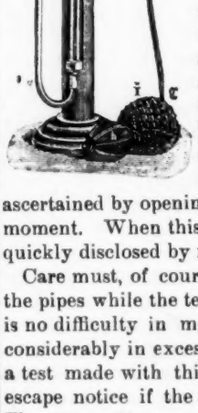
J. T. LYNN,
W. H. ODIORNE,
J. GIMPER, } Committee.

The convention was thereupon declared adjourned.

A Gas Leak Detector and Localizer.

The *Gas World* notes that it is easy for a gasfitter to discover when he has finished a job whether all the joints are tight. It is only necessary to attach a pressure gauge to the pipes and pump in air. If the gauge remains stationary all is well. But if it falls, then the gasfitter's troubles begin—he knows there is a leak somewhere ; but it may be in the cellar, in the drawingroom or in the top bedroom for all the gauge tells him. How is the loose joint to be found ? To wait till the meter has been fixed and the gas turned on has been hitherto the only available method. Then the leak can be localized by the sense of smell or by running a taper along the piping.

The other day we had the opportunity of inspecting an ingenious apparatus which is being introduced by Messrs. Falk, Stadlemann & Co., Ltd., of Farringdon Road, London, which will enable the fitter to complete his job at once, without waiting till the gas has been laid on. The apparatus is a combination of a pressure gauge and an air carburetter. The pressure gauge enables the pipes to be tested in the usual way, and if a leak is indicated then the carburetter is employed to fill the pipes with an odorous and inflammable gas. The apparatus is connected at *f* to the pipes to be tested, and pressure is brought upon the gauge by pumping air into the cylinder carburetter by means of the rubber ball *h i*. In use it is found advisable to first pump up the ball *i*, and then let the air in gradually by opening the stopcock *b*. Sufficient air is admitted to raise the water in the glass tube of the gauge an inch or two. The cock *b* is then closed. If the level in the gauge falls there must be a leak somewhere. The gauge may now be cut out by closing the cock *e*, and air is then pumped through the carburetter and through the pipes under test. The only precaution to be observed is to make sure that the whole length of pipe under test is filled with carburetted air, and this can be readily ascertained by opening the tap at the farthest point of the piping for a moment. When this condition has been obtained, any weak joints are quickly disclosed by running a lighted taper along the pipes.



Care must, of course, be taken to maintain a sufficient pressure on the pipes while the test is being made ; and we are informed that there is no difficulty in maintaining, with this small apparatus, a pressure considerably in excess of ordinary gas main pressures. Consequently, a test made with this localizer will discover minute leaks that might escape notice if the test were made with the ordinary gas pressure. The screw stopper *a*, shown on the top of the carburetter, is for recharging ; and to facilitate this operation the liquid hydrocarbon employed is supplied in small cylindrical tins, each holding a charge ; and we are told that one charge is sufficient to test the pipes in three or four average sized houses. It will be seen that with this apparatus, which can be easily carried in an ordinary tool bag, the gasfitter can assure himself at once that his job has been finished in a thoroughly sound manner. Another use to which it may be applied is to test the soundness of gas fittings before they are sent out from the factory or from the gas company's showroom.

American Contractors and British Contracts.[1]

Those persons whose leading desire is "not to be bothered" will not thank Lord George Hamilton for taking up the challenge thrown down in the House of Commons by Sir Alfred Hickman regarding the American railway contracts for India. It will be remembered that the member for West Wolverhampton, on the motion for adjournment over the Whitsuntide holidays, complained that large purchases of railway material made by companies under the control of the British Government, were negotiated under conditions not governed by business principles, or with due regard to efficiency, public safety, nor to economy. The accusation was not replied to by a representative of the Indian Government at the time, but Lord George Hamilton, who was not in the House, has since addressed a letter to Sir Alfred, in which he meets the allegations.

These allegations constitute, as Lord George Hamilton says, a serious indictment against the management of Indian railways. They carry with them the inference that the placing of the orders was not due to the ability of engineering firms in America to compete with English firms, but to the ignorance, carelessness, and partiality displayed by the railway directorate.

The chief matters in dispute are the purchase of twenty new engines from the Baldwin Locomotive Works, of Philadelphia, the construction of the Gôkteik Viaduct on the Burma railway by an American firm, and the purchase of certain locomotives, in Belgium, for Egyptian railways. Sir Alfred Hickman, basing his criticism on reports that have been made, says that the Baldwin locomotives are inferior to those manufactured by English firms. Lord George Hamilton, on the other hand, states that though the earlier reports were unfavorable, yet, when the working of these engines was better understood, and alterations were made to suit the local fuel, a marked improvement was noticed; so much so that one company wishes to obtain more engines of a similar construction. Sir Alfred Hickman then goes more closely into detail. He quotes the report of the last half of 1899, which says: "The twenty new engines received from the Baldwin Locomotive Works on the whole are doing well. They gave much trouble at first * * * in coal consumption. They do not compare unfavorably with our English engines."

The next report he quotes is that for the following 6 months, the first half of 1900. "We have," it is stated, "increased the height of the fuel fence on the tenders (of the Baldwin engines), to enable them to take sufficient fuel to last between wood fuelling stations. * * * I have taken out the consumption of all fuels for the first five months on all services. This shows that the Baldwin burnt 35.5 per cent more per train mile, and 23.5 per cent. more per vehicle mile than the English. * * * It is, therefore, evident that the remark made in the last report, that the Baldwins did not compare unfavorably in coal consumption, was rather premature."

It might perhaps be evident, if all the facts were known, but is by no means so, simply on the evidence quoted. Fuel per train mile is a very indefinite measure of efficiency; and even when the comparison is made per vehicle, the results may still be misleading. One needs to know, before definite information is obtained, whether the conditions of running were alike in both cases; whether the fuel was the same, the loading similar, and whether the same track was covered in the same direction, for the gradients may be favorable or unfavorable.

There is another point that should be cleared up. The first report quoted—that dealing with the last half of 1899—states that the American locomotives were burning coal, whilst in the following 6 months they were evidently using wood for fuel. It is desirable to know, therefore, whether these locomotives were designed for coal or wood burning.

Without going further, it is evident that unless Sir Alfred Hickman has far more detailed information than has been put at the disposal of the public, he is hardly warranted in bringing, to quote Lord George Hamilton's words, accusations of "ignorance, carelessness, and partiality" against the railway authorities. We are justified in assuming, in the absence of more direct evidence to the contrary, that the directors of the railways, under the guidance of their expert advisers, were acting in the best interests of the lines in ordering locomotives from abroad; and that there was no spirit of partiality which led, to quote Sir Alfred Hickman, "the railway officials to screen the Americans at all costs."

In regard to the Gôkteik Viaduct, it would appear that Mr. Constable, a late employé of the Burma Railway Company, and who was engaged in superintending part of the work of this bridge, reported that the riveting was defective. Lord George Hamilton states that "a most searching inquiry and inspection had been made by the chief engineers of the Burma Railway Company, assisted by the Government inspector, and they in no way indorsed Mr. Constable's opinion." The expression is a little vague, but we are bound to accept a statement from the principal Secretary of State for India without *arrière pensée*, and conclude that the authorities named were of opinion that the work was sufficiently well done. At any rate, we are informed that the Burma Railway Board, "composed of most competent railway experts, were satisfied that the work upon the bridge is sound and reliable."

So far we have the definite statements of a single engineer, who has since left the employment of the railway, in direct opposition to authorities that certainly, from their position, should carry more weight; supposing, of course, there were equal opportunities on both sides for gaining information. Sir Alfred Hickman, however, supports Mr. Constable's allegations by further evidence, the weight of which our readers may judge for themselves. He states that the inspecting engineer reported that "for 2 months he had little or no time to inspect rivets, and when he did examine 'he found the riveting not so good as formerly.'" Exactly what this means it is difficult to surmise, but it would appear that the inspecting engineer forebore to describe the riveting as "bad," or "dangerous." Possibly there may have been a lack of finish or appearance. It should be pointed out that this work was riveting done on the spot, presumably during erection, as it is reported to have been carried out "by coolies wholly unaccustomed to the work," and "physically incapable of doing it." This statement comes from the chief engineer of the Irrawaddy Steamship Company, who possibly was no more than a casual observer of the operations. Another indictment of a hearsay character, brought against the viaduct by a gentleman who has written to the papers, is contained in the following sentence, quoted by Sir Alfred Hickman: "I was informed by more than one engineer that one of the piers was out of the true, and had sunk slightly; it rattles a good deal. They say it won't last long." A pier that has sunk slightly is not altogether unknown in bridge construction, although we do not remember to have met with one that "rattles a good deal." However this may be, neither the sinking of a pier, nor bad riveting by coolies on the spot, can be considered as a reflection on American workmanship; the point Sir Alfred Hickman is striving to make.

It may be thought that we, like the railway officials (according to Sir Alfred Hickman), seem resolved to screen the Americans at all costs. We are careless as to such an accusation. Unlike Sir Alfred Hickman, we believe that American competition in the engineering industry is an extremely serious question, with which British engineers must deal in a most strenuous manner; and we are of opinion that it is the height of folly to put aside unpleasant facts by cavilling criticism on details. It is difficult to believe that English engineers should be guilty of the dishonesty attributed to them by Sir Alfred Hickman; for it would be nothing less than dishonesty, and that of a gross nature, if they betrayed the trust placed in them by screening the Americans. Sir Alfred gives Mr. Constable credit for disinterestedness. He says the latter "had no object to serve by reporting against the work." Why can he not allow equally disinterested motives to those who do not take his own view of the situation?

Sir Alfred Hickman, in his letter to Lord George Hamilton, touches a wider issue when he enters on the question of protection and bounties. "I will tell you," he says in his letter, "one great advantage which the Continental and American manufacturers have over ours. It is the system of what practically amounts to export bounties." He then goes on to point out that the Wire-Nail Syndicate, at a meeting held in Cologne, fixed prices at about 10s. a hundred weight for the home trade, and 7s. to 7s. 6d., f. o. b. Rotterdam, for the English market. The German Wire-Rod Syndicate made a profit on rods sold at home of £2 12s. 6d. a ton, and a loss on those they sold abroad of £2 4s. 6d. This, as Sir Alfred states, is an indirect but effective bounty of over 30 per cent. As our readers are well aware, the same policy, known as that of the "Surplus Product," is being largely pursued in America. If it is consistently followed we have some difficulty in seeing where the grievance of the English people at large arises. We could understand the German user of wire nails, or the American user of locomotives, raising a very vigorous protest against being compelled to contribute largely towards the cost of wire nails and locomotives supplied to the English market. If we can purchase wire nails at a cheaper rate than our German competitors, British goods, into the composition of which wire nails enter, should be made more cheaply than German goods, other things being equal. The same rule applies

1. *Engineering*, London, England, June 7.

to American locomotives; in fact, if the Americans will only carry the principle far enough, and sell us locomotives, steel rails, and rolling stock at merely nominal rates, we can reduce our railway freight charges to a very low point indeed.

A good many British steelmakers have been complaining of late that American manufacturers are taking their trade by selling steel in this country at less than cost price, recouping themselves by high prices charged in the home market. It is very natural for the British steelmakers to complain; but we have heard no lamentations from British shipbuilders on the same score. The latter rather take the view, so far as our observation goes, that as long as steel may be obtained cheaper in England than in America, so long will ships be constructed at British ports.

There is, of course, a danger in this, and one that should by no means be ignored. It is that the foreign steelmaker, either American or German, or perhaps the two combined, having killed the British industry, will raise their prices to an abnormal extent. Unless our manufacturers are handicapped by inferiority of natural resources—an eventuality entirely beyond our control—they should be able to make as stubborn a fight as their foreign competitors. There is, it is true, the protected market at home; but protection is a two-edged sword which may cut more keenly on the back stroke. Sir Alfred Hickman "ventures to assert with confidence, that but for the 37 per cent. duty, we should send more engines to America than they would send here." We gather from this that Sir Alfred Hickman assumes that the successful competition of American locomotive builders in neutral markets is due solely to the fact that the locomotives supplied to such markets are sold at prices far below those demanded for the same engines in the United States. We have not, however, had before us any evidence of the existence of such a state of things.

In regard to the detail of fuel economy, we should not be at all surprised to find that British locomotives have a superiority. It is a question, however, whether we in this country have not made fuel economy a feature to which too much has been sacrificed. It is a detail of expenditure, doubtless an important one, but it is possible to overestimate its value. The American railway manager takes the view that a few dollars extra spent on coal is a profitable outlay, if it enables an engine to do more work, better time to be kept, and other economies to be secured, in regard to capital expenditure, wages, etc.

These things, like other points raised, need working out quantitatively, so as to give a just balance on the total of expenditure and return. It may be that British engines would show a superiority. We cordially hope that such might prove to be the case, but, on the information we possess, we are assured that American competition in nearly all branches of engineering industry is not a thing lightly to be dismissed, in the way that some optimistic persons in this country would have us dismiss it. This is more true of some other engineering products than of locomotives. Steel bridgebuilders especially would do well to bear it in mind.

There is one other point on which we would touch in conclusion: "How do you account," Sir Alfred Hickman asks, with an air of triumph, "that the English maker is full of orders, while the American will undertake to deliver immediately, at any price?" The fact may not be so flattering to our home industry as the writer would have us suppose. If there is an excess of demand over supply, why do we not take steps to meet it? Is there in this country a lack of capital? A lack of confidence in its investment? A lack of talent for the management of manufacturing enterprise, or a lack of skilled workmen to carry on the operations? It is quite possible that the workshops of a country may be full of orders because they are too small, and there are too few competent operatives to supply the demand. The great engineering strike of three years ago has been given as a reason for orders going to America. That is not a cause of which Englishmen may feel proud. There are thousands of unskilled laborers who might have been competent mechanics had it not been for arbitrary restrictions placed in their way; and even those who are capable might turn out more work than they do were it not for a deplorable system which stifles energy and handicaps talent, reducing all to a low level of mediocrity. When we have engine building firms that can turn out, as one establishment in the United States can, a thousand locomotives in a year—when we have fewer millions of capital seeking profitable investment; when we have fewer able bodied men unemployed, who might be turned into skilled mechanics; when we have done all that can be done by the installation of improved machinery and labor saving plant—then it will be time enough to point with complacency to the fact that we have got to the end of our resources, and accept that other countries are encroaching on markets once exclusively our own.

[From the *Metal World.*]

Advantages of Tin Roofing.

Everyone is more or less anxious to live under his own roof, but in spite of this desire most people in planning their houses pay less attention to the kind of roof that is to cover them, than to any other part of the house. This should not be. The roof is a very essential part of the house. It is the top, the cover, the protector of the rest of the building. It is far more exposed than the walls. When the roof is damaged, all the other parts are more or less affected, hence the advice, "Look well to the roof in erecting the house," cannot be too strongly impressed on the builder.

When constructing the roof of a building the material used should always be of the best quality and of the most serviceable kind. Terne plates (roofing tin), of good, trustworthy quality, are the ideal roofing material, embodying all the characteristics that are requisite for a perfect roof covering. Roofing tin is practically impervious to all the external and internal attacks to which a roof is exposed. Roofing tin will not freeze in cold weather, it will not get soft in the hot sun. It withstands the destructive ravages of a storm. It is non-combustible. The licking flames of a conflagration cannot feed on it. Roofing tin is light in weight and, therefore, adapted equally well for stone, brick or frame buildings. It does not absorb dampness. It will not break if a stone or the limb of a tree falls upon it. It is suitable for roofing under all possible conditions and from the flat to the steepest pitched roof. The greater safety of a tin roof is well proved by the fact that the insurance rates on buildings covered with tin are less than on buildings covered with any other material. None of the many other materials which are offered for roofing purposes possess the universal advantage of tin roofing; the inflammable wooden shingle, the heavy and porous tile, the breakable slate, the dangerous paper and the cheap gravel, all possess disadvantages which are fully overcome by terne plates of good quality. A large majority of architects and builders strongly favor terne plates (roofing tin) as the best material for roofing, provided that they can be assured that the quality is first-class and that good workmanship is employed in the construction.

With the establishment of the fact that a roof constructed of good terne plates is far superior to any other kind of roof, it must, nevertheless, not be overlooked that even a tin roof, under certain circumstances, may prove to be a bad one. There are two causes which may produce such a result; either the terne plates were bad, or the workmanship in laying the roof was not good. Some years ago, when a craze for cheap material had taken hold of the people, it was not unusual for large quantities of the most inferior material to be dumped on the market and used for roofing in order to reduce the cost. The evil results of this craze have made themselves apparent. The cheaply constructed roofs are decaying by reason of the false economy practiced in their construction. Proof is furnished that material higher in price and first-class in quality would have been the cheapest. Fortunately conditions have changed again. The general prosperity of the country and the practical spirit which is animating the American public is now more than ever manifesting itself and the general demand is for materials of the highest grade.

The American tin plate manufacturers, who in the short space of 10 years have succeeded in building up a tin plate industry as large as, or even larger, than that of any other country in the world, are ever anxious to satisfy the demands of the people. American products in this line are admitted to be the most excellent the world over, which fact was recognized by the International Board of Judges of the "Exposition Universelle" at Paris, when they awarded to American tin and terne plates the first prize.

Anyone who desires to have a perfect roof can obtain it if he but goes to the trouble of making sure that he gets the proper quality of material, put down by experienced workmen. The American tin plate manufacturers, with their unequaled facilities in their vast resources and the best obtainable skill in the manufacture of terne plates at their command, have made a special study of the roofing plate branch of the business. The result is that to-day American tin plates stand pre-eminent. Different qualities of terne plates may be used in different districts. A quality of roofing plate suitable for one district may be totally unadapted for another district. But to meet all conditions terne plates are made to-day that will stand any climate. For standing seam roof a poorer quality may be used than for a flat seam roof, but observing the truism that the best is the cheapest in the end, none but the best qualities should be used in all cases, and, if this rule were adopted universally, all objections and prejudices which may exist in some localities against tin roofing would soon disappear.

Roofs made from good plates may be spoiled by bad workmanship. To guard against this a few hints are given here, the observance of which is of the utmost importance in the proper construction of a tin roof. Roofs with less than one-third pitch are made with flat seams, and should preferably be covered with 14 by 20 sheets of roofing tin rather than with 20 by 28 sheets, because the larger number of seams stiffens the surface and helps to prevent buckles and rattling in stormy weather. For flat seam roofs 1 inch barbed and tinned roofing nails should be used, not over 6 inches apart, well under the edge. The nails must never be exposed.

Steep tin roofs should be made with standing seams, and from sheets 20 by 28 inches, fastened down with cleats, not over 2 feet apart. One end of the cleat is folded into the seam and the other nailed down. Nails should be driven in the cleats only.

While it is always cheapest to use best material, a lesser coating is permissible on steep standing seam roofs than for flat seam roofs with small pitch. In IC roofing plates, in which the iron body weighs about 50 pounds per 100 square feet, are more suitable than IX plates, which weigh about 62½ pounds per 100 square feet, because the seams in the lighter plates will not suffer as much from contraction and expansion as the thicker plates. The amount of terne coating on the lighter sheets should in all cases be fully as heavy as on the heavier plates.

For spouts, valleys and gutters heavily coated IX plates should always be used.

The use of acid in soldering seams in a tin roof is to be carefully avoided; acid, coming in contact with the bare iron on the cut edges and corners where the sheets are folded and seamed together, will cause rusting. No other soldering flux than good rosin should be used.

Every roof should be carefully cleaned and all rosin spots and detrimental substances should be removed as the tinners' work is being finished. Lumps of rosin left on the roof will melt in the sun, stick to the roof, cause blisters in the paint and prevent it from adhering.

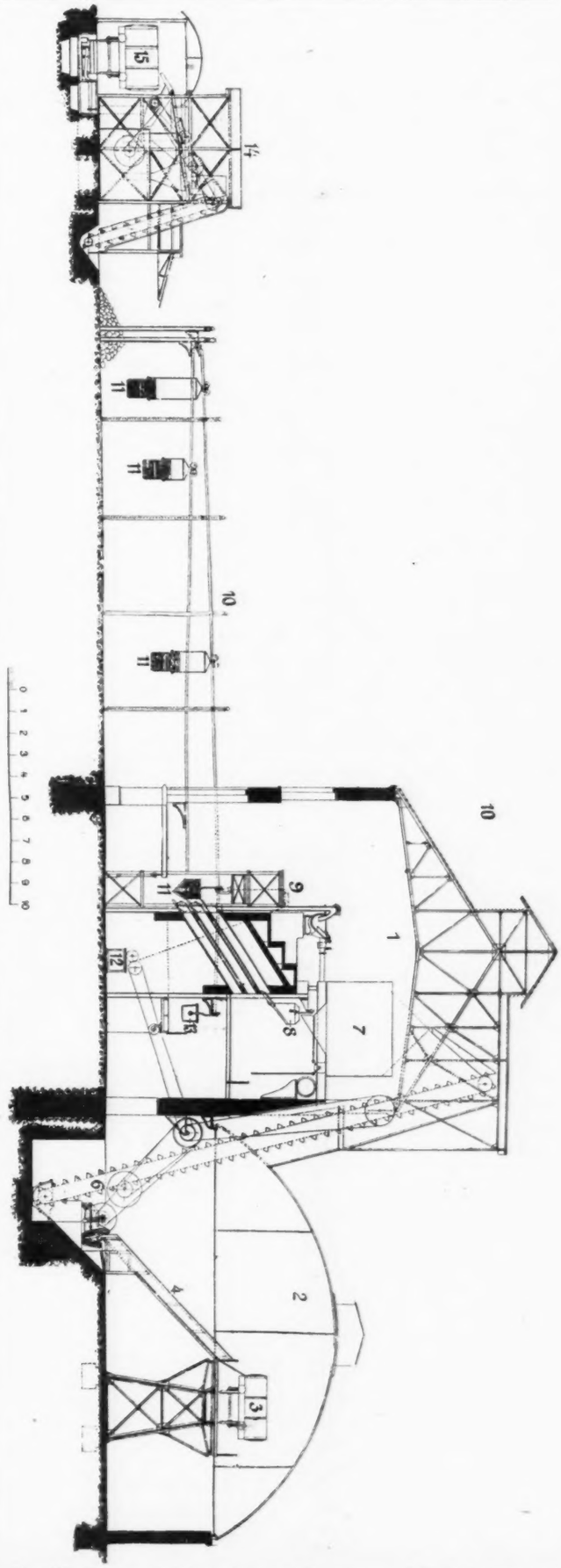
For valleys, spouts and gutters of a tin roof no other metal than terne plates should be used, because the galvanic action produced by different metals coming in contact with each other will cause disintegration under atmospheric influences.

The sheeting boards underlying the roofing tin should be put close together. The wood should be well seasoned, dry, and all knots should be culled out. It is also advisable to cover the boards with good building paper before the tin is laid on. When no paper is used, the tin must, in all cases, be painted before it is laid and fastened on the roof. The outside should receive two coats of paint as soon as the roof is finished. To make tin roofs last for generations they should be repainted every 3 to 5 years with good iron oxide and linseed oil paint, while the frequency of the intervals will depend largely on the climatic conditions of country.

[Translated from the *Journal fur Gasbeleuchtung*, by MR. FREDERIC EGNER.]

Sketch of a Modern Coal Gas Works in Alsace.

The works about to be described are located at Mülhausen, Alsace, and were erected a little over two years ago, since which time they have been in successful operation. In view of the growing interest in the mode of coal gas manufacture that there prevails we give the illustration herewith presented. The system is that of the Coze inclined retort plan together with attendant coal and coke handling apparatus. In the diagram 1 is the retort house; 2, the coal shed, into which the coal is brought direct from the nearby railroad switch. The cars shown at 3 are run onto a track scale, and then unloaded, by means of running the coal over a chute 4, through coal breaker 5, into the boot of the elevator 6, and on, up and into the elevated coal pocket 7. From this pocket, which will hold about 48 hours' full supply of coal, the charges for the retorts are drawn as required into retort charging wagon 8. This wagon is carried on a suspended rail track. The coal is taken to the retorts to be charged, and when the lower lip of the wagon is pulled forward, it opens a door in the wagon which permits the coal to enter and fill the retort with any sized charge for which the charging apparatus may be set—of course, within reasonable limits. In front of the benches there is a horizontal rail track on which the coke wagons are suspended, and can be run back and forward to the front of any retort which is to be discharged. At one end of the house is a lift, 9, which is operated by means of a winch, 12. A suspended rail track, 10, is fixed to uprights leading to and from the coke yard. This track declines from the horizontal, from the outlet end to the far end of the coke storage and back to the retort house. When the coke wagon, 11, has been filled from the retort, it is pushed to the end of the house, where the lift is located, and raised to the outgoing end of track, 10. There it rolls of its own accord to the point of discharge, which is effected by pulling the catch at bottom lid of wagon, and so on, back again to the retort house, where it is lifted to the horizontal rail in front of the bench, mentioned before. Track, 10, extends to the back or charging end of the bench, and another wagon, 13, is used to convey coke from the front to the back of the bench, and there to fill the fuel gas generator when required. At 14 is shown the coke preparing and loading apparatus. This consists of a breaker and differential screens, sack and wagon loading chutes, and a track scale, on which is shown a car, 15, ready to be loaded and taken away. The scale given in the diagram represents meters, and by means of it the reader can obtain about the dimensions of the plan shown. The advantages of the system have been repeatedly stated by writers here and abroad, and we therefore confine ourselves to the simple descriptive diagram shown.



Blue Printing by Electric Light.

By Mr. H. G. Reist.

In large manufacturing establishments the short and frequently dark and cloudy days of winter are the occasion of great inconvenience and delay in the production of blue prints. A printing plant suitable for making the required number of prints in summer will be entirely inadequate for the same production in winter. Unfortunately, this is a department which ordinarily cannot be worked overtime in order to make up for the loss. Suffering much on this account because of the large number of blue prints required, the General Electric Company some time ago tried several methods of printing by electric light. In one plan a small room was arranged with nine arc lamps, placed about 18 inches apart, suspended from the ceiling, and by a suitable arrangement of reflectors, a large portion of the light was thrown downward on printing frames arranged on trucks, being the same frames which are used ordinarily for printing by sunlight. The reflectors are hinged so that the light may be thrown to the position wanted. With a rapid printing paper the time required for printing with this arrangement is from six to eight minutes.

Another arrangement for printing, and one which is being used extensively with somewhat more satisfactory results, consists of two lamps, each being a standard 5 ampere, 110 volts inclosed arc lamp, inclosed by a metal hood a little larger in size than the printing frame. The hood is strongly constructed of sheet iron, with parabolic sides, which are finished on the inside with white enamel, having good reflecting power. The hood is supported on the lamps, and in order to prevent the parts from overheating, an effective ventilating device is provided at the top. There are also handles on the side so that it may conveniently be moved along the track. The lamps in turn are supported on a small trolley arrangement, made from the parts used for sliding folding doors, and on each side there is a conducting wire from which a small trolley wheel carries the current to the lamps. The tracks on which the lighting device is supported are of sufficient length, so that five printing frames can be set under each of them, and the lamps readily moved to cover any one of them. The printing frames which we are now using are the standard frames used for sun printing, although they can be somewhat simplified if they are made specially for printing by electric light. The lamps are inclosed in white opal globes. This diffuses the light and the white interior of the reflector projects it downward, so that the area over the print to be made is very uniformly lighted, there being no perceptible difference in the tone of the print in the middle from what it is in the corners. When the first print has been exposed a sufficient length of time, the light and the hood are moved along the track to the next frame, while work is begun on the first one to replace the printing paper or tracing as the case may be.

The time required for printing naturally varies widely with different tracings and different makes of paper. In general, it may be stated that the time required is three times or four times as long as with bright sunlight. With one grade of paper which we are using, the time by sunlight in the middle of the day during February is about 35 seconds, and by electric light 1½ minutes. It will readily be seen that there are great advantages in having a printing establishment which is independent of the season or of the condition of the weather. With an electric equipment blue prints may be put into the factory almost immediately after the completion of the tracing, regardless of the time of day.

In summer it is possible to print all the time during office hours, and the per cent. of time lost on account of cloudy and rainy weather is small. In winter it is not practical to print after about 4 o'clock in the afternoon, and the amount of bad weather is a large part of the total time. In the belt in which I live it is cloudy as much as 60 per cent. of the time during the months of December and January. In cloudy weather the time required for printing is about 8 times to 10 times as great as on a clear day, and on a rainy day it is not possible to print at all out of doors, except by a specially devised waterproof printing frame; but at such times the time required for changing prints is greatly increased, as the frame has to be wiped to keep from injuring the tracing.

From curves of the actinic value of sunlight for different times of the day and for different seasons, I have calculated that with a paper so rapid that it will print in 8 seconds in the sun at noon during the month of July, the mean time required for making a print in January for the hours from 8 to 12 and from 1 to 4 is 2.33 minutes. Similarly, in July the mean time for the hours above, except that the time is extended to 5:30 in the afternoon, is 0.59 minutes, or the mean time for clear days during the year is 1.40 minutes.

Taking all the above into account, I find that the average number of prints made by one operator in winter per day is 26.4. In summer the number of cloudy days are about 25 per cent., and the average number of prints that may be made by one operator is 57.3, or more than twice as many as can be made in winter.

The cost of making prints by electric light is much smaller than one would expect, and the following figures indicate that it is cheaper to use artificial light than sunlight for this purpose.

In printing by electric light it is assumed that the cost of electricity is 12 cents per kw. hour, which, I believe, is a fair commercial rate. The lamps are turned off when not in use. They are in use only 85 minutes for each operator, as shown in the table below. Each lamp requires 550 watts, and the cost is 18.7 cents per day.

Labor is assumed at the rate of $1 per day:

	Sunlight.	Electric Light.
Number of prints per day, mean per year.....	41.9	56 5
Cost of printing, per print.....	2.39 cts.	2 03 cts.

The time required for changing a print in sunlight is a little longer than when the artificial light is used, because the whole frame has generally to be moved, and the frame has to be adjusted to the proper angle to get the most effective sunlight. The time allowed for changing prints is 7 minutes when printing by electric light, 8 minutes when printing by sun, while when printing during a rainy day as much as 20 minutes may be required. It will then be found an advantage to use electric light printing as a supplement to the ordinary method, even if the latter method is not entirely superseded. Among other advantages may be mentioned the smaller space required for an installation for a given output than for sun printing; also, there will be less paper wasted, as the time for printing is much more uniform.

This method of making prints will especially appeal to manufacturers who are located where there is a tendency to have fogs or where tall buildings may interfere with the normal sunlight.

SPECIAL ENGLISH CORRESPONDENCE.

Communicated by Norton H. Humphrys.

Salisbury, England, June 10, 1901.

Mond Gas—Progress with the Welsbach Burner.—Experiments with Gas and Electricity at Manchester.—Detecting and Localizing Leakages.

A large portion of last month's letter was occupied by particulars of the Mond gas scheme, which has now received the sanction of Parliament on lines very similar to those then anticipated. Gas people in England regard it much in the same way as the coke oven process is looked upon in the States, though it does not come so close to coal gas. It makes no coke or tar so will only enter the residual market in competition to gas companies, as a manufacturer of sulphate of ammonia. And the gas is a diluted non-luminous mixture, very different from coke oven gas. Having succeeded so far, we may expect to see it promptly put into practical operation by the original promoters of the scheme. People who hold what they anticipate to be a profitable line, neither hesitate, nor pass it over to another party, but get to work at once and rake in the shekels. It would, therefore, at this juncture, be ungracious and out of place to enter upon a further discussion of the technical peculiarities of the process, or the prospects of success as viewed in the light of several years' experience in manufacturing, purifying, storing, distributing and selling ordinary 16-candle gas. Such an expression as "Gas at 2d. per 1,000 cubic feet" makes a grand head line for the local news sheet, and has been used as such without stint. Almost every newspaper in the country has given its characteristic variation of the same line, all, of course, overlooking the trifling consideration that the minimum quantity supplied will be about 25 million cubic feet per annum to secure those terms. All this idle chatter is nothing more than amusing, and not always that, and we now wait with interest the result of a trial on the practical scale. A great deal, of course, turns upon whether there is much demand for this weak-kneed decoction of nitrogen and generator gas.

The Welsbach Company have just brought out an important improvement applicable to public lighting, consisting of a modified arrangement of the Kern burner somewhat resembling the bulb pattern with metal chimney, but with the difference that the place of the bulb is taken by a short glass cylinder, which is suspended from the chimney, and is quite independent of the burner. No gallery or chimney support is required, and the space usually occupied by that device is left clear and unimpeded, for the free downward radiation of the light. It is applicable to ordinary street lanterns, and is complete in itself, requiring no auxiliary apparatus for creating increased pressure, either of gas or air. With a consumption of 10 cubic feet of gas per hour, and a No. 4 mantle, a light equal to 280 candle power is claimed to have been obtained. The modifications in the interior of the burner are intended to secure a complete mixture of gas and air and at the same time offer as little impediment as possible to the velocity of the current, thus securing perfect combustion, and a flame

so short as not to exceed the dimensions of the mantle. All this is feasible enough. While others have been calling in the aid of water motors, or other elaborate devices, to increase the pressure of air or gas, the engineers on the staff of the Welsbach Company have been pegging away on the old lines, and they are to be heartily congratulated on the steady but substantial advances they have already scored. Not so very many years ago it was stated that the Welsbach Company had gone one better—and a very large *one*—on the highest record of the regenerator lamp, which was a duty of about 10 candles per cubic foot of gas, and that their "C" burner would give a 15 candle duty, nearly 5 times that of the standard Argand. Gas engineers soon became aware that this 15 could be brought up to nearly 20. Then came the Kern burner with a practical 25 candle power duty, and in spite of considerable prejudice, this has firmly established itself. And now, almost before we have had time to appreciate the Kern, comes a further very respectable advance of 3 candles in duty. This sort of thing calls for the highest possible assistance and encouragement from gas companies, and of the various improvements in working results that have been before the gas profession, this advance in the practical value obtainable by means of the Welsbach burner is neither the least important, the least remarkable, nor the least interesting.

Experiments in the use of gas and electricity and their comparative cost for street lighting, have been conducted in Manchester, and some figures prepared by Mr. John G. Newbigging, gas engineer to the corporation, have been published. Since both the gas and the electricity works belong to the municipal authorities, these results may be regarded as strictly independent and free from party bias, and, therefore, may be received with more freedom than if they were prepared by parties interested in one of the systems only. Including interest on outlay, maintenance, attendance and all charges, gas lighting by flat flame burners costs 7.5d. per 1,000 candle hours, low pressure incandescent gas lighting by means of Kern and of "C" burners, 1.96d., and high pressure incandescent gas lighting 1 77d. Electric arc lighting costs 3d., and electric incandescent lighting 12d. per 1,000 candle hours. These figures are based on gas at 2s. 6d. per 1,000 cubic feet and electricity at 4d. per unit. Some details as to the gas experiments are given, from which it appears that the first cost of the low pressure incandescent installation, including anti vibrators and labor, was £750, and the experiment is charged with interest on this sum at 10 per cent. Gas cost £1,822 and renewals of mantles, rods and chimneys £325 during the year ended 31st March last. The test of intensified lighting was on a much smaller scale and extended over only 36 days. The first cost was £155, and the gas cost £10 7s. 6d., water and extra attendance, £2 8s. 3d., and mantles, rods, etc., £4 7s. 7d. No details as to the electricity experiments were given.

These figures are much more favorable to electricity than other reports and a little examination explains the cause. In the first place, it would appear that the duty obtained from incandescent electric lamps is much higher than that usually claimed by electricians. The inclusive figure for 1,000 candle hours is just equal to the cost of 3 units, and as it covers costs of renewals, etc , it follows that the actual duty obtained was something considerably over 333 candle hours per unit. Electricians claim 250 to 280. In the low pressure gas experiments, no distinction was made between the "C" and the "K" burners, but as the latter give considerably better duty than the former, and as the cost of the mixed test is only 10 per cent. more than that of the intensified light, it follows that the Kern burner by itself pushes very closely upon its more complicated rival. In other words there is no money saving in intensified lighting, the extra duty obtained being more than covered by the cost of compression, extra consumption of mantles, etc. The cost of mantles for intensified lighting amounts to about 23 per cent. of the whole, although the experiment was conducted under exceptionally favorable conditions as to weather. But the corresponding figure with the low pressure system, including chimneys and covering a whole twelvemonth, thus securing a fair share of frost and rough weather, was only 12 per cent. of the whole. The simpler and preferable plan, if increased light is desired, is to increase the size or the number of burners, rather than to incur the trouble and expense of intensifying. If this is the case, with apparatus available a year ago the improved burner above described completely turns the scale in favor of the low pressure system. Mr. Newbigging's figures are based upon a duty of 18 candles for the low pressure, and 30 for the intensified light. We have yet to learn whether the new burner necessitates an increased consumption of mantles corresponding to that of the high pressure system. One would suppose, however, that a mantle would wear more rapidly under a consumption of 10 cubic feet, than at 5 cubic feet of gas per hour. Allowing for this we may say that the new system adds 40 per cent. to the duty recorded by Mr. Newbigging or reduces the cost in like proportion. It would cost less than 1½d. per 1,000 candle hours, and not half the cost of electric arc lighting.

One of the greatest needs in the gas industry is sound fitting work. Gas managers themselves know the importance of getting mains and services perfectly gas tight, but cannot always get their customers to see that good sound work, if a little more costly in the first place, is the cheapest in the end. And most of them have to mourn over several vacant places in the service record book caused by cheap and badly laid fittings put in at the instance of some ignorant or of some scrimping contractor. The occupant pays the price and believes that his house is all perfection. In a week or two comes complaints of a smell of gas, and the trouble is only located and remedied by interference with the new paper, new paint and new carpets. If much of this sort of thing is experienced, the disgusted and annoyed householder declares that he will get rid of the gas altogether, and has it cut off. The gas company loses a customer, straight, and worse than that, a rumor gets about that there are always "smells" in houses piped for gas, and would-be customers are led to think twice before they act once.

One great obstacle has been the want of an apparatus that will both prove a system of gasfitting, and locate any defects that may be found. The usual plan is to test the pipes with an air pump, and if all is sound, well and good, but if there is a leak the gas must be turned on in order to locate it. Many fitters, knowing that their work is sure not to cut a very grand figure under the pump test, ignore it altogether, and turn on the gas as a means of testing. Messrs. Falk Staddleman & Co., of London, have come forward to fill a much needed want by introducing their "gas leak indicator and localizer," a portable apparatus that can be carried in any tool basket. It is very simple, its salient points being a small pressed rubber hand air pump, a carburetter, and a U pressure guage. The method of using is obvious. The fittings are first tested for soundness in the usual way, a sufficient pressure being created by means of the pump. If a leak is found, the carburetter is used, to fill the pipe system with an odorous inflammable gas. A charge of benzoline is introduced, and air pumped through it until the whole system is charged with air gas, which is assured by opening a tap at the far end. The pipes are kept under pressure until the leak has been located in the usual way. Armed with this apparatus the workman can be held responsible for the soundness of his work, and cannot get behind an excuse that the gas was not laid on. The meter need not be fixed until the tenant actually requires to use gas, whereas at present it is fixed to enable the fittings to be proved and the gas supply is then at the command of any workman who may subsequently visit the premises to complete the papering and painting, with the result that the ground is laid for a dispute with "that rascally" gas company over the first quarter's bill.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

"J. M." writing from Dallas, Tex., under date of the 15th inst., says, among other things: "The Dallas Gas and Fuel Company, under the management of Mr. Thomas D. Miller, is having phenomenal success in the sale of gas ranges and hot water heaters. The Company has gotten rid of, or rather placed two carloads this season, and will undoubtedly sell the third. From 5 to 10 stoves are being placed daily. Mr. Miller has devised the best method for canvassing I have ever seen. Absolutely every person on a gas main in Dallas has to buy a gas stove or give a good reason for not doing so. Mr. Miller, as you well know, is a broad gauged gas man, and would doubtless be glad to give any of his friends a 'tip' as to his methods."

Mr. W. B. Miller has been appointed Superintendent of the Gas Light Company, of Augusta, Ga., which position carries with it the complete management of the plant.

Mr. Samuel J. Fowler, for several years Manager of the Springfield (Mass.) Gas Light Company, is about to retire from its service. We understand that Mr. F. De V. Thompson is to be his successor.

The gas and electric lighting interests of Ossining (formerly Sing Sing) and the adjoining village of Croton, N. Y., have been consolidated under the title of the Ossining Heat, Light and Power Company.

Mr. John Lillie, Secretary and Superintendent of the Port Townsend (Wash.) Gas Works, was recently chosen Eminent Grand Commander, Knights Templar, of the State of Washington.

Mr. Robert Bruce Steward, Vice-President of the D. M. Steward Mfg. Company, of Chattanooga, Tenn., forwards us the following circular recently issued by Mr. D. M. Steward, President of the Company, which explains itself:

"In order to settle some serious differences of long standing, and to permanently rid myself of the hampering efforts of the minority stockholders in the D. M. Steward Mfg. Company, I have, through application to the Chancery Court, had the corporation placed in the hands of a receiver, whose instructions from the Chancellor are to sell out the business within 30 days to the highest bidder.

"I did not take these extreme measures until after the minority stockholders had refused the very fair and even liberal offer which I made for their holdings. They demanded an unreasonable figure, which I refused to pay. It is possible that they may attempt to force the bidding beyond the amount of the proposition which I have made. If they do so, I will allow them to buy in the business. In this event, they will find themselves with a large and completely equipped plant on their hands, the operation and management of which they have absolutely no knowledge. Every official and employee formerly connected with the corporation is bound to me, not by contracts or subsidies but by mutual friendship and esteem.

"I am sole owner of all live patents under which the D. M. Steward Mfg. Company is operating. More than 25 years ago I originated this business, and have spent my entire time and efforts in developing and building up the business. The minority stockholders have not been represented in the active management of the business, but have attended the annual stockholders' and directors' meetings and confined their efforts to fault finding and grumbling, and trying by every possible means to oust me from the management of the firm.

"Within a stones' throw from the plant of the D. M. Steward Mfg. Company is the well equipped, modern factory of the State Line Mfg. Company owned by me, and which has been in steady, successful operation for 5 years. In case the minority stockholders overbid me, it is my intention to extend and enlarge this plant, so as to embrace all the lines formerly made by the D. M. Steward Mfg. Company. Associated with me will be Mr. R. B. Steward, former Vice-President of the D. M. Steward Mfg. Company, R. W. Gates, who was its Secretary, the entire office force, superintendent, foremen, and leading workmen.

"Until the permanent ownership of the D. M. Steward Mfg. Company is settled, I would request my friends and former customers of the D. M. Steward Mfg. Company to address all communications relating to new business to me. I have arranged office facilities for caring for all such correspondence, and prompt attention will be given. In order that you may have no delays or inconvenience, orders will be referred to the Receiver of the D. M. Steward Mfg. Company, and provision made for their prompt shipments by him until prompt shipments can be made from the factory of the State Line Mfg. Company.

"In closing, I wish to express my sincere thanks and hearty appreciation for the substantial support given me by my friends, which has enabled me to build up a very successful business."

We are indebted to Mr. Milo Roy Maltbie, Secretary of the Reform Club Committee on City Affairs, of New York, for an advance copy of the "spring issue" of "Municipal Affairs," which is "a quarterly magazine devoted to city problems," and which is published by the Reform Club. The aforesaid spring issue is in reality a very copious index to the literature extant respecting "municipal problems and city conditions." It is well compiled and clearly printed, and it should have a place on the book shelves of every managing gas man. The address of the Secretary is 52 William street, New York.

All the outside employees of the Oakland (Cal.) Gas Light and Heat Company will hereafter be required to wear uniforms.

The plant of the Everett (Wash.) Gas Company will be located at the foot of California street, that city. The site has a frontage of 200 feet on the Snohomish river. Mr. C. R. Collin's, the Company's constructing engineer, hopes that the plant will be in operation by Nov. 15th.

As a result of what is known as the Mendenhall litigation, the works of the Livermore (Cal.) Gas Company have been shut down, until such time as Mr. W. M. Mendenhall, the successful litigant, will have disposed of the property at public auction. Meanwhile, the clamor in Livermore for gas is loud, especially amongst those who had been using gas stoves.

D. T. Morse, writing from St. Louis, Mo., under date of the 14th inst., says that early this month the City Council of Wichita, Kas., granted to S. L. Nelson and associates a franchise for the construction and operation there of a gas plant. Under the terms of the agreement he must supply gas at a maximum rate of $1.50 per 1,000, gross; prompt payment (within 15 days) to entitle the user to a rebate of 15 cents per 1,000. The franchise is to run for 20 years, and it is to be forfeited if construction work is not commenced within 12 months from the dating of the ordinance. On its face, the scheme looks an "unwhiskered" strike.

The Trustees of the village of Patchogue, L. I., have refused the petition of Mr. John Gerety and others for the right to operate a gas works there. The ground for the denial was that the petition was defective, but to one who knows the situation it is probable the refusal was backed by the desire to as far as possible save the local electric lighting suppliers from harm. The next petition, which will be handed in soon, will not be in any sense "defective!"

A scheme for the establishment of a works for the supply of gas to the districts of Monterey and Pacific Grove, Cal., is underway.

At the annual meeting of the Denver (Col.) Consolidated Gas and Electric Light Company the following officers were chosen: President, Henry L. Doherty; Vice-President and General Manager, Irvin Butterworth; Secretary, F. W. Frueauff.

The properties of the Tiffin Gas Light and Fuel Company, the Tiffin Electric Light Company and the natural gas properties in Tiffin, O., of the Kerlin Bros., have been consolidated under the corporate title of the Consolidated Gas and Light Company, of Tiffin. The incorporators are Messrs. M. B. Daily, R. W. Kirby and C. F. M. Niles, of Toledo; J. M. Barr, of Findlay; and W. H. Dore, of Tiffin.

Mr. A. C. Sickels, President of the new Steelton (Pa.) Gas Company, says that the plant will be in operation by Sept. 15th.

The new plant at Manitowoc, Wis., has been completed.

Papers announcing the incorporation of the New York and Richmond Gas Company, of New York city, have been filed. The object of the concern is to furnish gas and electricity in New York city, "particularly in the borough of Richmond." It is likely the Company is the result of much dickering that has been going on for a year or more to consolidate the lighting interests of Staten Island. The capitalization named is $1,500,000. The Directors are: Armitage Matthews and Robt. C. McCormick, of New York; Archibald A. McGlashan, of East Bloomfield, N. J.; G. W. Sutton, of New Rochelle, N. Y.; and Hawkins A. Tucker, of Brooklyn, N. Y.

The properties of the Oroville (Cal.) Gas, Electric Light and Power Company and the Oroville Water Company have been merged. The principal party in interest is Mr. J. W. Goodwin, of San Francisco.

Mr S. S. Rubira, President of the Mobile (Ala.) Gas Light and Coke Company, aunounces that important improvements are to be made on the plant.

There is a strike on amongst the retort house hands of the Cleveland (O.) Gas Light and Coke Company. Higher wages than the prevailing rate seems to be at the bottom of the trouble.

Mr. A. E. Evans, of the Western Reserve University, has been appointed Assistant Gas Inspector for Cleveland, O., vice Mr. H. L. Payne, removed.

Notice of the formation of the Watkins (N.Y.) Consolidated Electric and Gas Light Company has been given. Its capitalization is $100,000, and its Directors are: A. R. Horn, of Catasaqua, Pa.; J. J. McKee, of Bethlehem, Pa.; and Chas. B. Reid, of New York city.

Messrs. Baxter & Young, of Detroit, have about perfected their plans for the construction of the gas plant at Sault Ste. Marie, Mich., the franchise for which was secured some time ago by Dr. Goltra and his associates.

"F. R. P.," writing under date of the 18th inst, says: "The City Council of Chicago, by a vote of 49 to 15, approved the contract with the Peoples Gas Light and Coke Company, as reported by the Finance Committee, for the lighting of the streets of the city. The action was taken after a long debate and the voting down of a couple of amendments, the final vote being taken under the operation of the previous question. The contract, as drawn by the Corporation Counsel, provides the Company shall light for a year, free of charge, at least 25,000 street lamps, after having first equipped them with incandescent burners. On its part the city agrees to light, extinguish and maintain the lamps. In consideration of providing the free gas the Company will cease paying to the city the 3½ per cent. on its gross receipts, unless this percentage should amount to more than the $350,000, to which it is estimated the cost of the lighting will amount. Should there be any excess it will be paid to the city."

The Pennsylvania Gas Company has decided to maintain the demand that users of natural gas in Erie, Pa., shall pay therefor 32 cents per 1,000 cubic feet less 2 cents per 1,000 for prompt payment.

The foreclosure sale of the Citizens Gas Company, of Bridgeport, Conn., did not come off at the appointed time, and a postponement to July 12th was ordered. Meanwhile a certain Mr. Samuel Thorne has offered $300 (on the basis of par being 100) per share for a controlling interest, or for all of the stock in the old Bridgeport Gas Light Company. Those who should know say this bid is offered on behalf of the Connecticut Railway and Lighting Company, which concern likely has more or less interest in the "securities" of the Citizens Company.

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PROPRIETORS.

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AGENTS:

New York—American News Co. 39 and 41 Chambers St.
Germany—Lemcke & Buechner, of New York.
England—Aug. Siegle, 30 Lime Street, London.

MONDAY, JUNE 24, 1901.

The Market for Gas Securities.

There is nothing of moment to chronicle regarding the local gas situation, the rates for city shares to day (Friday) being quite like those of a week ago. The net difference in quotations for the week's trading is about one point on the low side. The opening bid for Consolidated was 222¼. Sales were made at 222, and the close was 222 to 222½. Some grumbling has been occasioned by the refusal of the Company to continue leasing gas ranges at the rate of $3 per year, but in the end we believe the users of gas for cooking will be better satisfied with the scheme of outright purchase of the stoves. The howl, though, in the matter of stiff rates for an electric lighting service, is pronounced. New Amsterdam 5's are in good demand.

Brooklyn Union is steady, at the figures reported last week. Baltimore Consolidated is inquired for at improving prices, and those who should know say that by September next the shares should readily command 75. Peoples, of Chicago, is pronouncedly strong. There is nothing of importance to note in connection with the general gas share market, save it is that prices are remarkably well maintained.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.
16 WALL STREET, NEW YORK CITY.
JUNE 24.

☞ All communications will receive particular attention.
☞ The following quotations are based on the par value of $100 per share.

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$73,177,000	100	222	222½
Central Union, Bonds, 5's	3,000,000	1,000	106½	107
Equitable Bonds, 6's	1,000,000	1,000	105	..
" 1st Con. 5's	2,300,000	1,000	120	..
Metropolitan Bonds	658,000	..	108	112
Mutual	3,500,000	100	300	310
" Bonds	1,500,000	1,000	100	102
Municipal Bonds	750,000	..	..	.
New Amsterdam Gas Co. ..				
Bonds, 5's	11,000,000	1,000	108¾	109¼
Northern Union, Bonds, 5's.	1,250,000	1,000	106	108
New York and East River .				
Bonds 1st 5's	3,500,000	1,000	111	115
" 1st Con. 5's	1,500,000		106	108
Richmond Co., S. I.	348,650	50	100	..
" Bonds	100,000	1,000	103	
Standard	5,000,000	100	130	135
Preferred	5,000,000	100	150	155
Bonds, 1st Mortgage, 5's	1,500,000	1,000	115	117
Yonkers	299,650	500	130	
Out-of-Town Companies.				
Brooklyn Union	15,000,000	100	216	220
" " Bonds (5's)	15 000,000	1,000	118	11
Bay State	50,000,000	50	⅝	¾
" Income Bonds	2,000,000	1,000	.	75
Binghamton Gas Works..	450,000	100	24	28
" 1st Mtg. 5's	509,000	1,000	92½	25
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	7	8
" " Bonds, 5's	5,250,000	1,000	70	72
Capital, Sacramento	500,000	50	..	35
Bonds (6's)	150,000	1,000		
Central San Francisco	2,000,000	..	106	108
Chicago Gas Co. Guaranteed Gold Bonds	7,650,000	1,000	104	104¼
Cincinnati Gas & Elec. Co	29,500,000	100	103¼	103½ x
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	106	107
Columbus (O.) Gas Lt. & Heating Co	1,682,750	100	60	65
Preferred	3,026,500	100	84	86
Consumers, Jersey City Bonds	600,000	1,000	102	103
Consumers, Toronto	1,700,000	50	215	216
Consolidated, Baltimore	11,000,000	100	63	64
Mortgage, 6's	3,600,000	..	..	118
Chesapeake, 1st 6's	1,000,000	..	..	..
Equitable, 1st 6's	910,000	..	..	..
Consolidated, 1st 5's	1,490 000	..	..	112
Consolidated Gas Co. of N.J.	1,000,000	100	11	14
" Con. Mtg. 5's	380,000	1,000	81½	83
Consolidated G. & E. Co.'s., Little Falls, N.Y.	90,000	100	..	100
Bonds	75,000	..	..	100
Detroit City Gas Co	4,825,500	50	.	89
" Prior Lien 5's	5,603,000	1,000	99½	100
Detroit Gas Co., 5's	381,000	1,000	89	89½
" Inc. 5's	16,000	100	94	94½
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	..	101
Essex and Hudson Gas Co.	6,500,000	..	35	40
Fort Wayne	2,000,000	..	..	.
" Bonds	2,000,000	..	54	58
Grand Rapids Gas Lt. Co. 1st Mtg. 5's	1,225,000	1,000	104	105¾
Hartford	750,000	25	240	250
Hudson County Gas Co., of New Jersey	10,500,000	..	25	..
" Bonds, 5's	10,500,000	..	101	103
Indianapolis	2,000,000	..	60	68
" Bonds, 6's	2 650,000	..	95	98
Jackson Gas Co	250,000	50	70	75
" 1st Mtg. 5's	290,000	1,000	101	102½
Kansas City Gas Light Co., of Missouri	5,000,000	100	..	36
Bonds, 1st 5's	3,822,000	1,000	101½	103
Laclede, St. Louis	10,000,000	100	84	85
Preferred	2,500,000	100	98	101
Bonds	10,000,000	1,000	..	108½
Lafayette Gas Co., Ind.	1,000,000	100		60
Bonds	1,000,000	1,000	60	66
Louisville	2,570,000	50	110	120
Madison Gas & Elec. Co.				
" 1st Mtg. 6's	350,000	1,000	102½	108
" 6 per cent. scrip, due 1910	100,000	25	87	89
Montreal, Canada	2,000,000	100	182	184¾
Newark, N. J., Con. Gas Co	6,000,000	..	..	55
Bonds, 6's	4,600,000	..	..	103
New Haven	1,000,000	25	280	300
Nashville Gas Lt. Co.	1,000,000	50	110	..
Oakland, Cal.	2,000,000	..	46	47
" Bonds	750,000	..	..	..
Peoples G. L. & Coke Co., of Chicago	25,000,000	100	119¾	120
Peoples Gas Lt. & Coke Co., Chicago, 1st Mortgage	20,100,000	1,000	..	..
2d "	2,500,000	1,000	104	
Rochester Gas & Elec. Co.	2,150,000	50	88	..
Preferred	2,150,000	50	118	..
Consolidated 5's	2,000,000	..	87½	90
San Francisco, Cal.	10,000,000	100	..	.
St. Paul Gas Light Co.	1,500,000	100	50	54
1st Mortgage 6's	650,000	1,000	82	85
Extension, 6's	600,000	1,000	..	..
General Mortgage, 5's	2,465,000	1,000	88	90½
St. Joseph Gas Co.				
" 1st Mtg. 5's	751,000	1,000	36	39
Syracuse, N. Y.	1,750,000	100	15	19
Bonds	1,612 000	1,000	91	93
Washington, D. C	2,600,000	20	295	300
First mortgage 6's	600,000	..	..	..
Western, Milwaukee, Bonds, 5's	4,000,000	..	93½	95
Wilmington, Del	600,000	50	200	201

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DIVIDEND NOTICE.

OFFICE OF THE UNITED GAS IMPROVEMENT CO.,
N. W. CORNER BROAD AND ARCH STS.,
PHILADELPHIA, PA., June 12, 1901.

The Directors have this day declared a quarterly dividend of 2 per cent. (one dollar per share), payable July 15th, 1901, to stockholders of record at the close of business, June 29. Checks will be mailed.

1358-4 LEWIS LILLIE, Treasurer.

POSITION WANTED.

Experienced Chemical Engineer and Gas Man

Desires position. Familiar with burner work of all kinds; incandescent gas, oil and gasoline; also, gas distribution and meter work. Best references.

1359-1 Address, "L. G.," care this Journal.

Position Wanted

A COMPETENT MAN desires position with gas company. Understands laying mains, services, gasfitting, attending complaints, etc. Has also had experience in electric lighting. Address,

1359-1 "G. H.," care this Journal.

Position Wanted

As Assistant Superintendent or Working Foreman,

By a young man 27 years of age. Understands laying mains and services; reading, setting and repairing meters; lead connections; gas stoves; and all kinds of compaint work in or on the outside of a gas works. Understands manufacture and distribution. Can give A, No. 1 references.

1359-1 Address, "V.," care this Journal.

POSITION WANTED

As Working Superintendent, Assistant Superintendent or Foreman.

Twelve years' experience in laying mains and services, reading, setting and repairing meters. Understands the setting and adjustment of all kinds of gas appliances; is competent in the manufacture of coal gas. Is 27 years of age, is married, is willing and industrious and is desirous of getting a steady position. Medium or small company preferred. Best of references, from two gas companies.

1357-3 Address, "J. P.," care this Journal.

Position Wanted

As Superintendent of Gas Works,

By a man who, for the last 17 years, at different times, has worked on a salary, leased and owned interests in gas works. Can give the best of references. Address,

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Six-Foot Station Meter.

GEORGE McLEAN,

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One 8-Inch Hopper tree Main Governor, With 8-inch by-pass attached. Complete, in perfect working order.

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Two Purifying Boxes, 7 feet by 8 feet 6 inches by 2 feet 6 inches.

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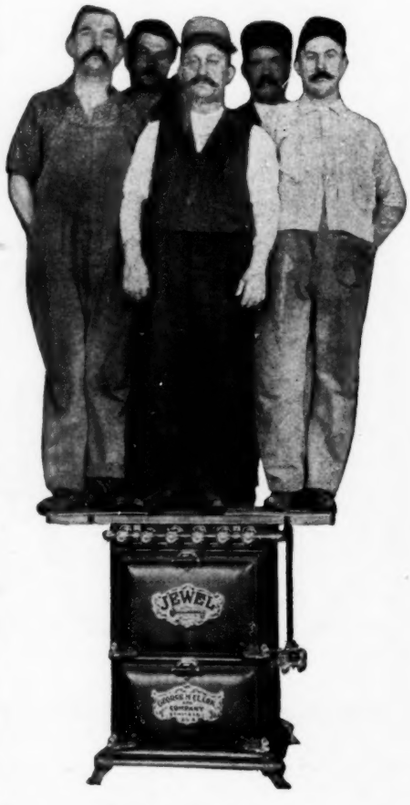

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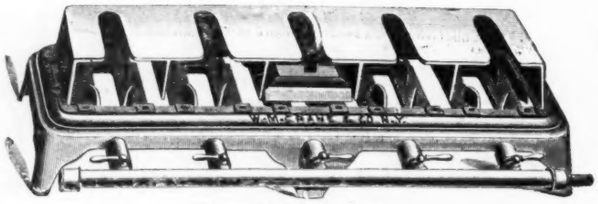
Means big profits. It is an easy matter for your customers to see the difference between VULCAN GAS APPLIANCES and other kinds. There is no disguising the fact that they do better work at less expense than any others.



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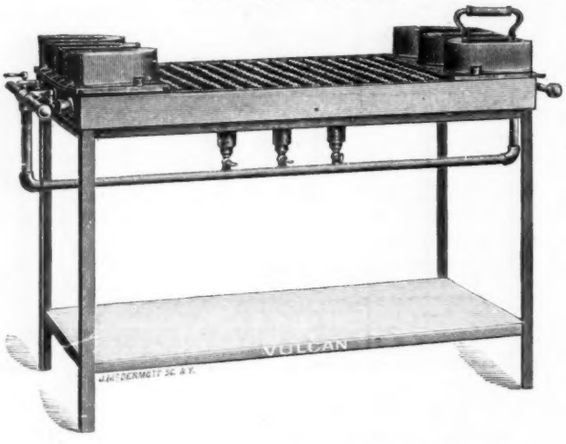
are made in 3 styles and 5 sizes, holding from 1 to 5 irons. Space for iron, 4¾ inches wide.



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for heating irons and a wash boiler at the same time—strong—simple—compact—easily cleaned. There is a good sale for this stove in hotels, laundries, institutions, etc.

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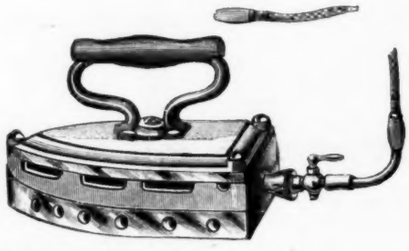

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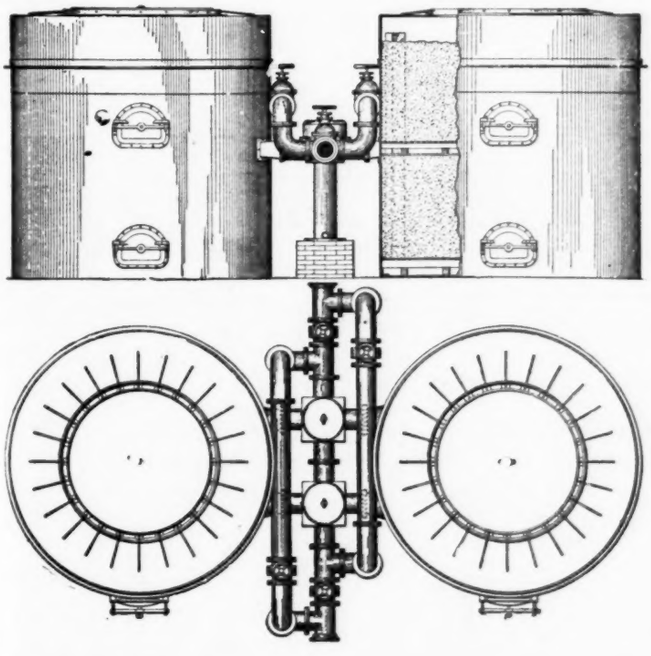

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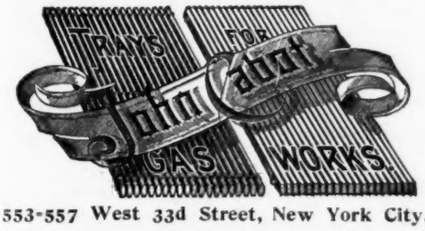

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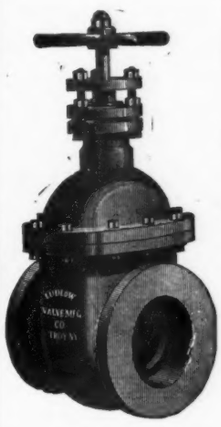

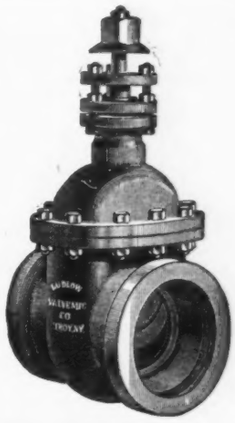

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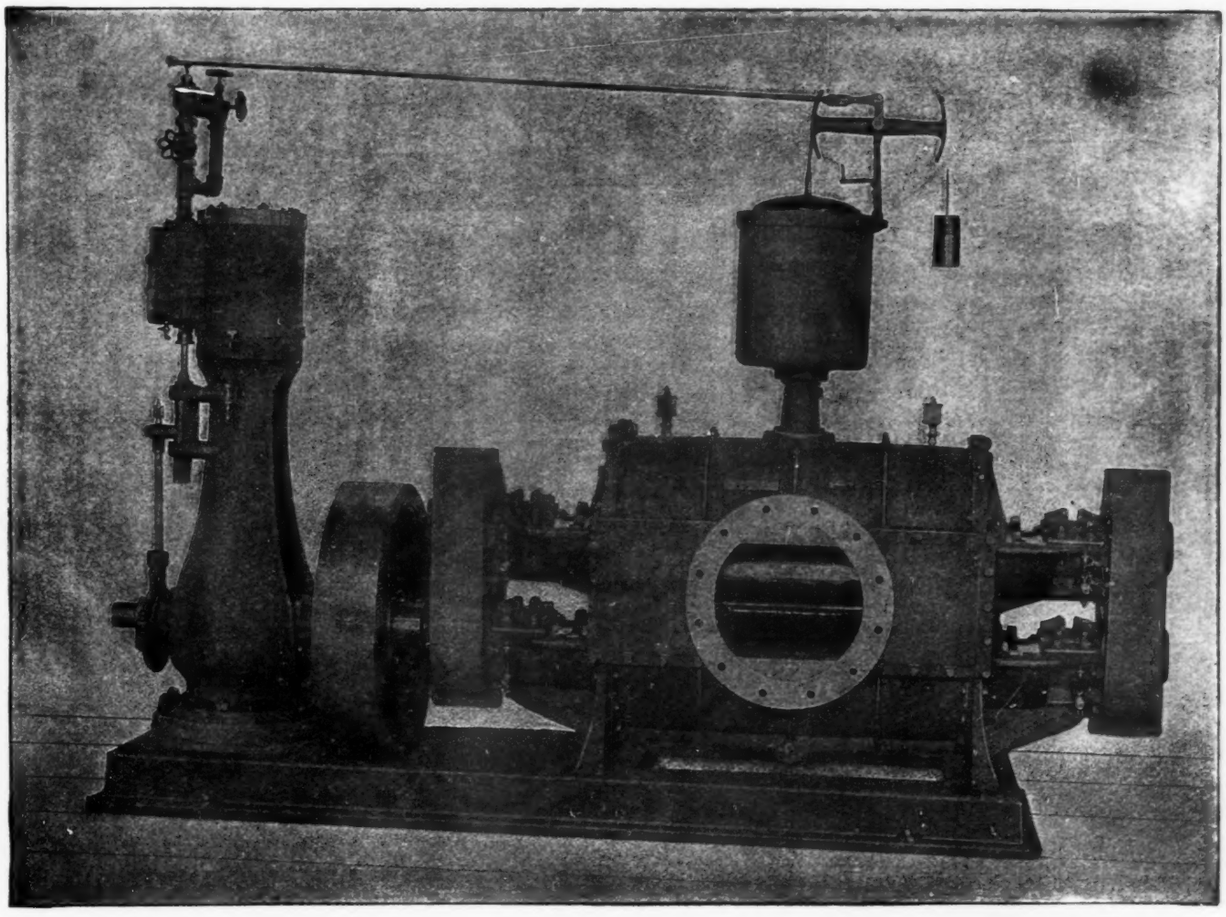

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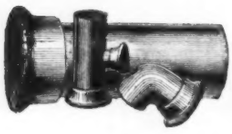

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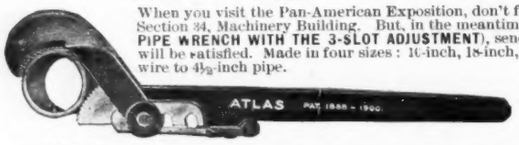

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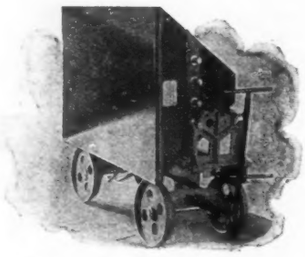

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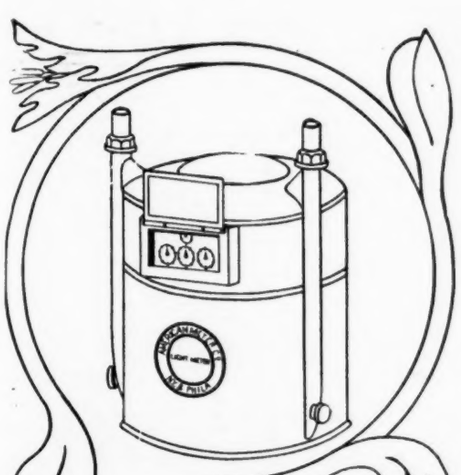
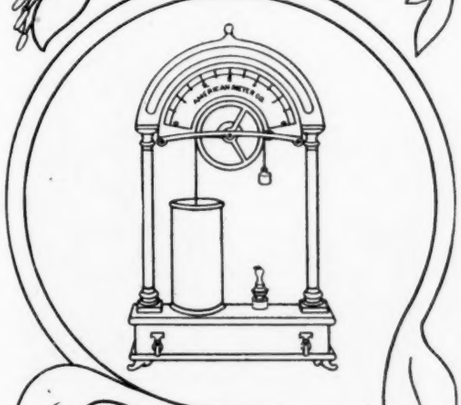
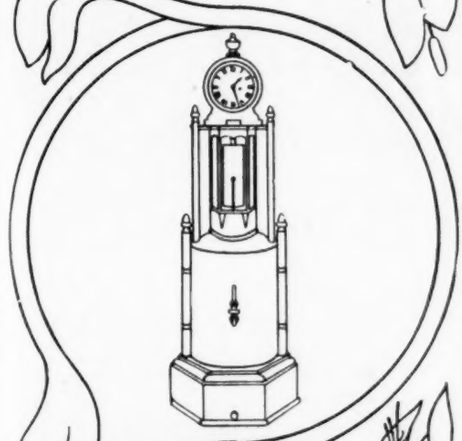
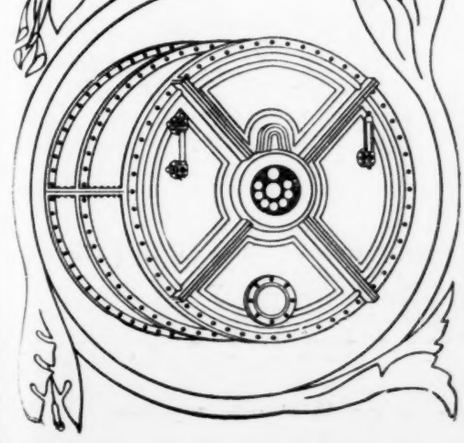








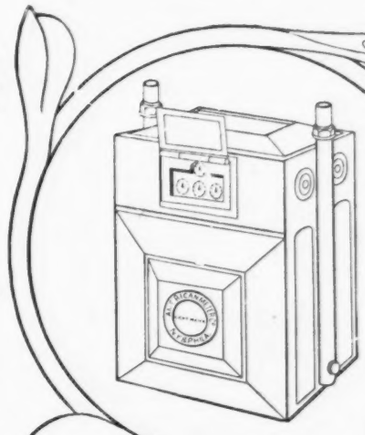
PUBLIC LIGHTING TABLE.

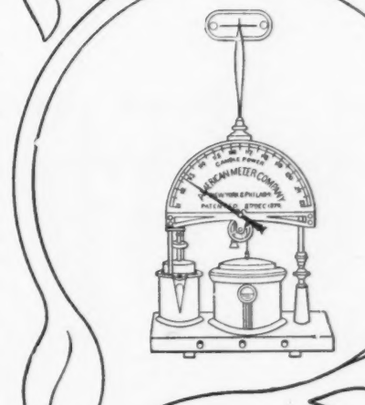
JULY, 1901.

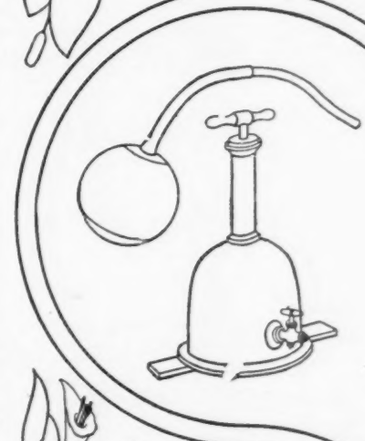
Day of Week.	Date.	Table No. 1. Following the Moon. Light.	Table No. 1. Following the Moon. Extinguish.	Table No. 2. New York City. All Night Lighting. Light.	Table No. 2. New York City. All Night Lighting. Extinguish.
				P.M.	A.M
Mon.	1	No L. FM	No L.	7.30	3.15
Tue.	2	No L.	No L.	7.30	3.15
Wed.	3	8.00 PM	9.30 PM	7.30	3.15
Thu.	4	8.00	10.10	7.30	3.15
Fri.	5	8.00	10.40	7.30	3.15
Sat.	6	8.00	11.10	7.30	3.15
Sun.	7	8.00	11.50	7.30	3.15
Mon.	8	8.00 LQ	12.20 AM	7.30	3 15
Tue.	9	8 00	1.00	7.30	3.15
Wed.	10	8 00	1.40	7.30	3.15
Thu.	11	8 00	2.30	7.30	3.15
Fri.	12	8.00	3.40	7.30	3.15
Sat.	13	8.00	3.40	7.30	3.15
Sun.	14	8.00	3.40	7.30	3.15
Mon.	15	8.00 NM	3 40	7.30	3.15
Tue.	16	8.00	3.40	7 20	3 15
Wed.	17	8.00	3.40	7.20	3.15
Thu.	18	8.00	3.40	7.20	3.15
Fri.	19	8.00	3.40	7.20	3.15
Sat.	20	8.50	3.40	7.20	3.15
Sun.	21	9.20	3.50	7.20	3.15
Mon.	22	9.50	3.50	7.20	3.15
Tue.	23	10.20 FQ	3.50	7.20	3.15
Wed.	24	10.50	3.50	7.20	3.15
Thu.	25	11.40	3.50	7.20	3.15
Fri.	26	12.20 AM	3.50	7.20	3.15
Sat.	27	1.10	3 50	7.20	3.15
Sun.	28	2.10	3.50	7.20	3.15
Mon.	29	No L.	No L.	7.20	3.15
Tue.	30	No L. FM	No L.	7.10	3.30
Wed.	31	No L.	No L.	7.10	3.30

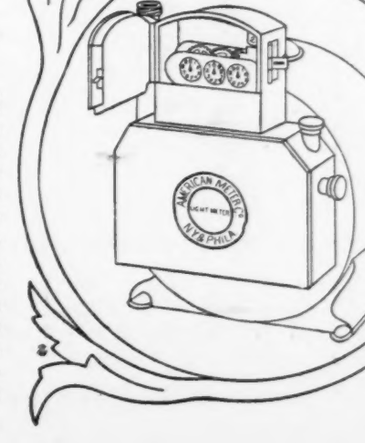
TOTAL HOURS LIGHTING DURING 1901.

By Table No. 1.	Hrs.Min.	By Table No. 2.	Hrs.Min.
January	220.10	January	423.20
February	192.30	February	355.25
March	180.00	March	355.35
April	158.30	April	298.50
May	140.40	May	264.50
June	135.40	June	234.25
July	138.00	July	243.45
August	156.20	August	280.25
September	174.40	September	321.15
October	202.30	October	374.30
November	220.40	November	401.40
December	241.30	December	433.45
Total, yr.	2161.10	Total, yr.	3987.45









NEW YORK, 33 Nassau St. PHILADELPHIA, Broad and Arch Sts. CHICAGO, 54 Lake St.

Welsbach Street Lighting Company

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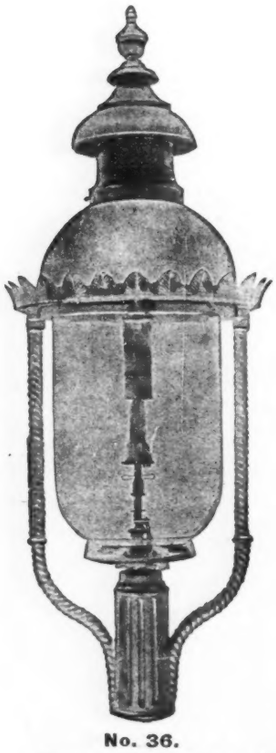

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By means of the Welsbach System of street lighting the superiority of GAS over electricity for street lighting has been fully demonstrated.

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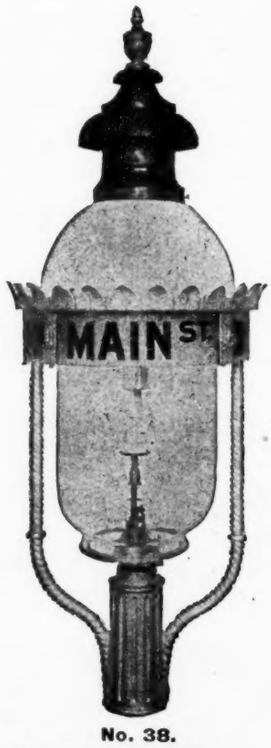
Where there are no gas mains we can furnish an equally good light by our SELF-GENERATING NAPHTHA WELSBACH BURNER, and thereby supply a uniform light in all localities.



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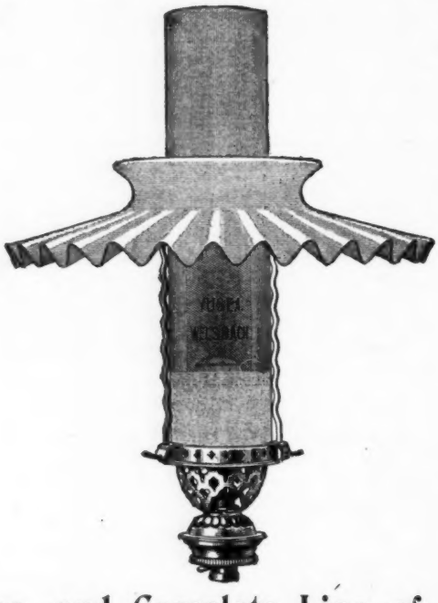

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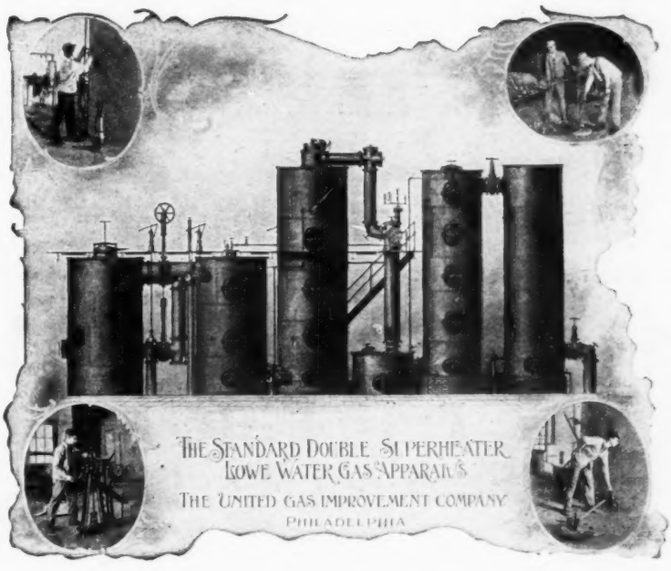
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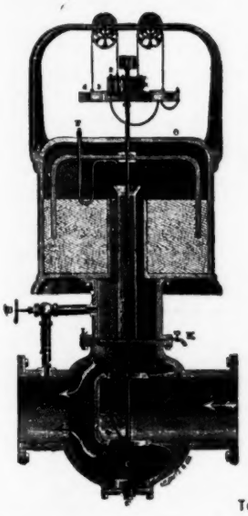

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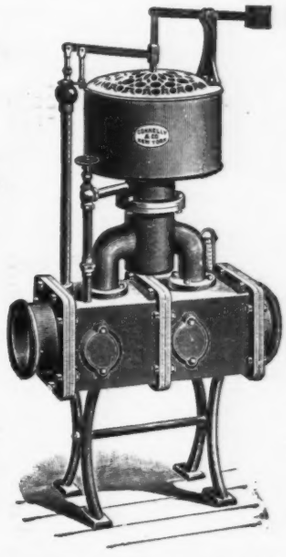

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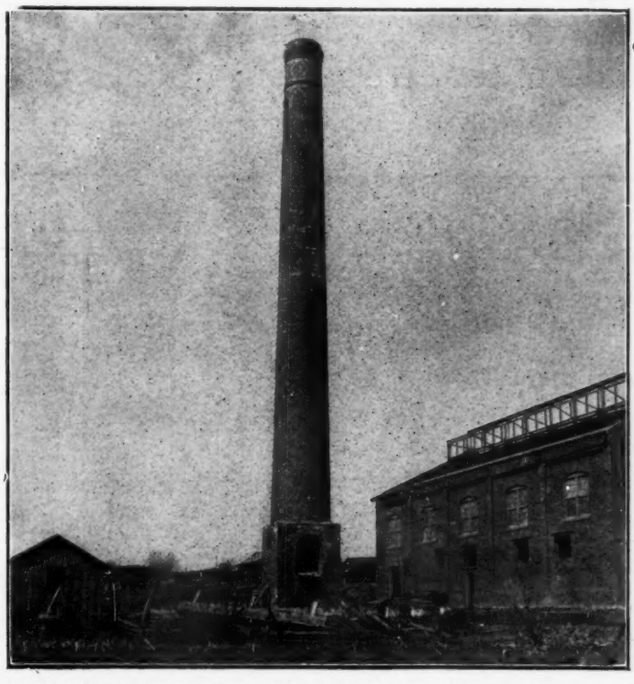

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Carefully prepared.
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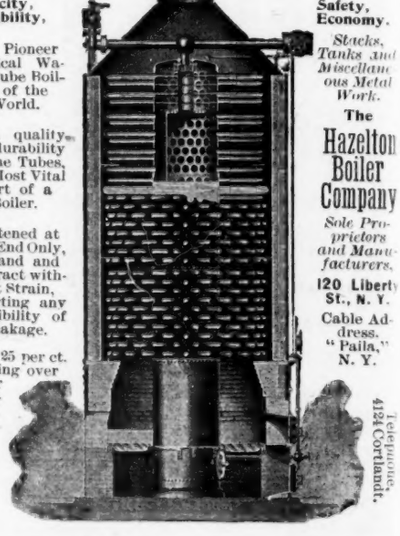

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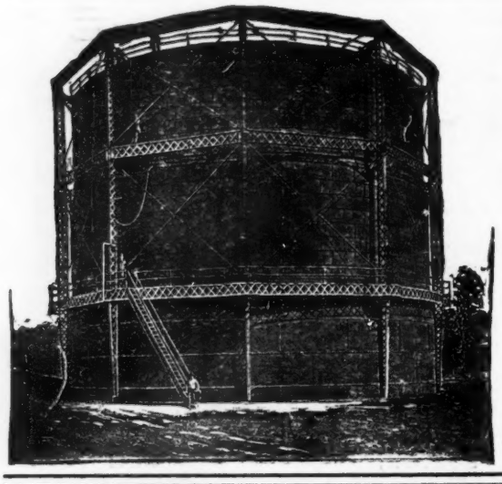

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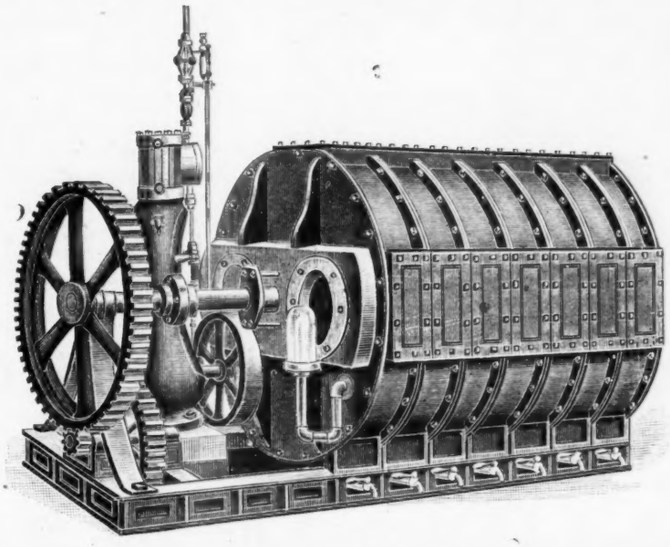

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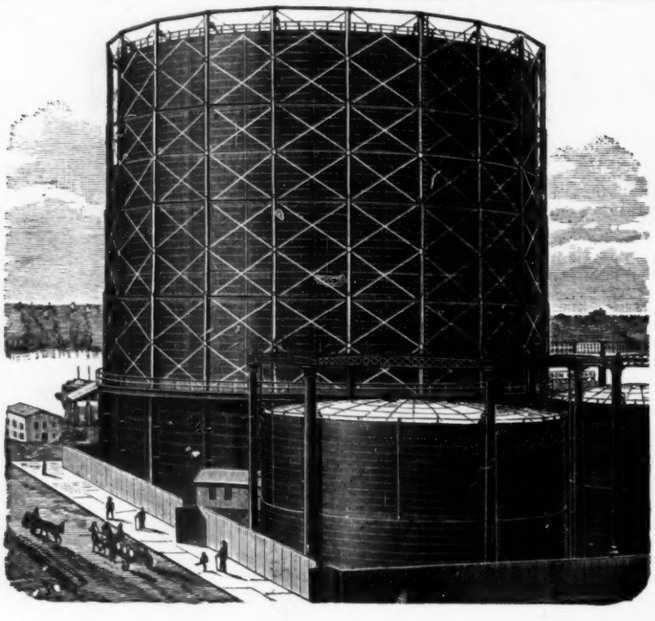

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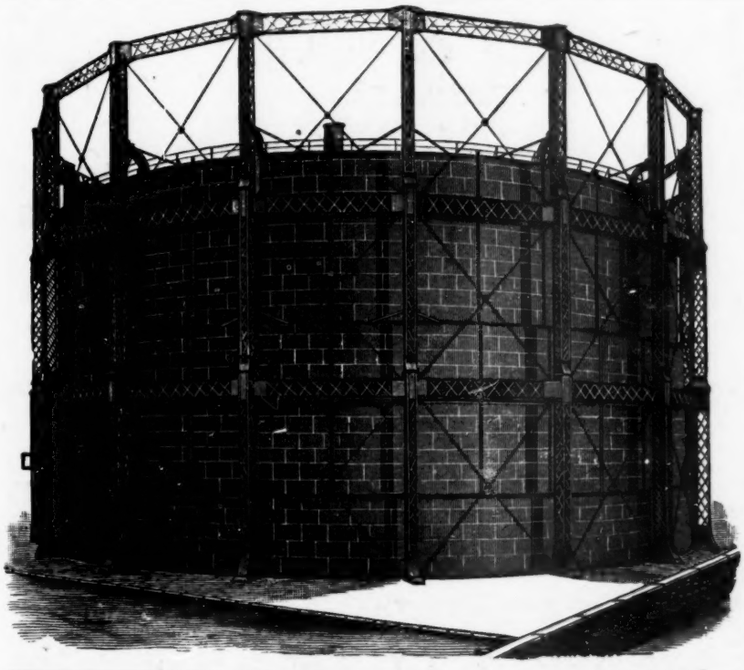

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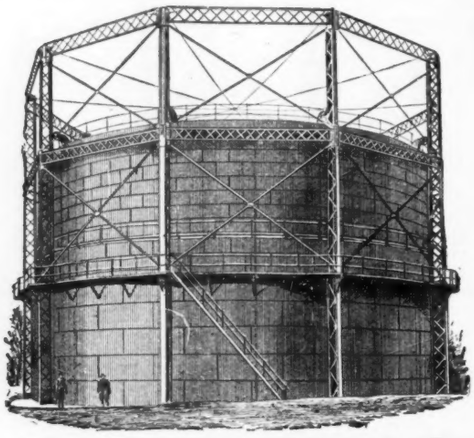

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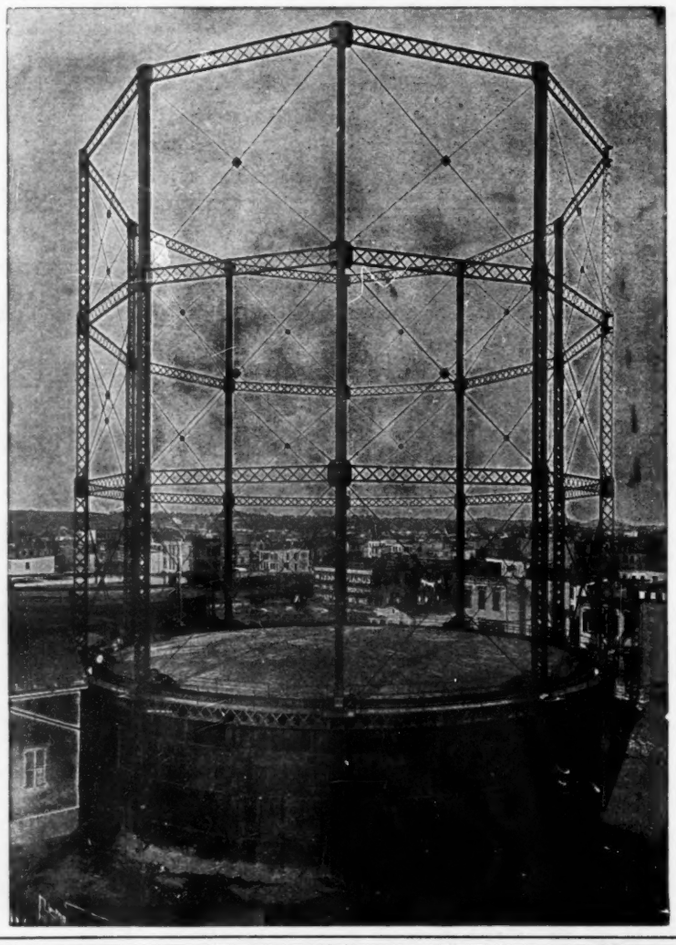

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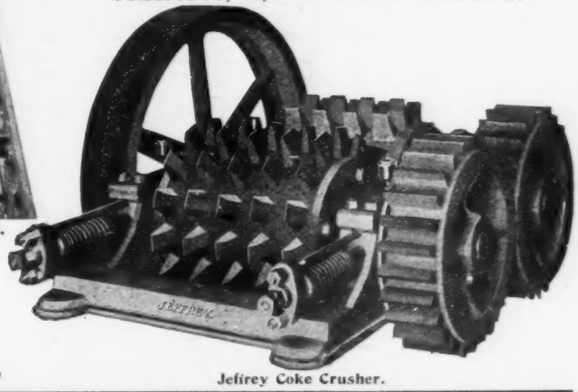

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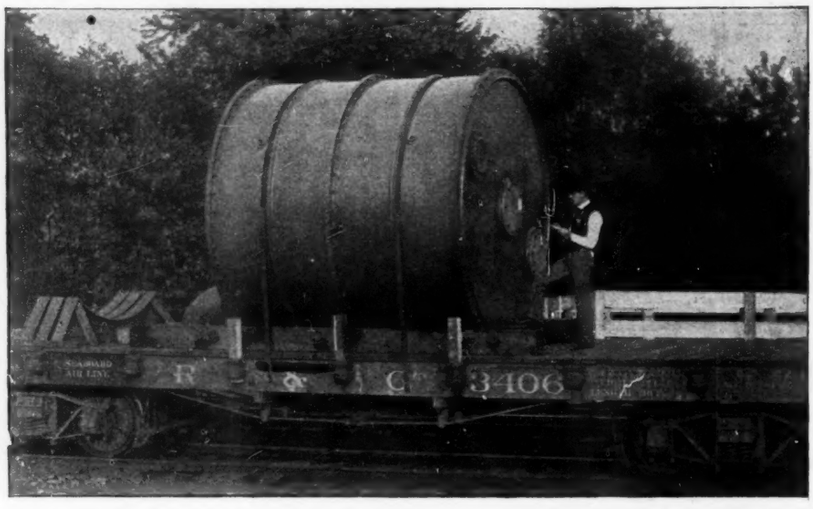

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